

DOCUMENT RESUME

ED 319 567

RC 017 553

TITLE State of Nevada Telecommunications Study. Assembly Concurrent Resolution 68.

INSTITUTION Nevada State Dept. of General Services, Carson City.

PUB DATE 88

NOTE 285p.; Some graphics may not reproduce well.

PUB TYPE Reports - Evaluative/Feasibility (142) -- Legal/Legislative/Regulatory Materials (090)

EDRS PRICE MF01/PC12 Plus Postage.

DESCRIPTORS Access to Education; Cost Estimates; Educational Technology; Information Needs; *Information Networks; Information Technology; State Action; State Agencies; State Legislation; *State Programs; State Surveys; Statewide Planning; *Systems Development; *Technological Advancement; *Telecommunications

IDENTIFIERS *Nevada; Technological Infrastructure; *Telecommunications Policy

ABSTRACT

This document offers the results of a study of Nevada's telecommunications requirements, based on a comprehensive survey of existing networks associated with state and local governments, school districts, and the university system. It reports that Nevada can accrue benefits from telecommunications in the areas of education, economic development, and government efficiency. In education, an integrated telecommunications system would mean expanded access to higher education, more institutional cooperation, and expanded access to information resources. The integrated network would also give Nevada a competitive advantage in recruiting business to the state. State and local government agencies, including police, tourism, and justice departments, could cut costs and save employee time by using a statewide telecommunications network. Two key recommendations evolved from the study: (1) that the state should fund a pilot project to evaluate the potential of a statewide integrated voice, data, and video network and; (2) that the state should provide a centralized organization staffed with qualified personnel to manage and plan Nevada's telecommunications resources. States that have implemented similar telecommunications networks have experienced savings while expanding public services. The document also recommends that the State Legislature provide \$810,000 over a 2-year period for a pilot telecommunications project. The specific telecommunications needs of individual government and education agencies are charted in detail. Network features, costs, and lease-purchase options also are described. (TES)

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STATE OF NEVADA
TELECOMMUNICATIONS STUDY

ACR 68

1988

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EXECUTIVE SUMMARY

"The cities, states and companies that plan for the new information age will be in a key position to reap its benefits."

John Nesbitt - Megatrends

Assembly Concurrent Resolution 68 (ACR 68) directed the Department of General Services to conduct a study of statewide telecommunications requirements. A comprehensive survey of city, county and state government, school districts and the university system was completed. Two key recommendations resulting from evaluation of the survey results are:

1) The State of Nevada should fund a pilot project to evaluate the potential of a statewide integrated voice, data and video network.

2) The State of Nevada should provide a centralized organization staffed with qualified personnel to manage and plan the State's telecommunications resources.

Telecommunications networks of the information age are becoming the railroads and highways of the industrial age. Nevada, city, county and state governments, school districts and the university system have identified hundreds of new applications for expanded voice, data and video services that would improve productivity, reduce costs and enhance service offerings. Based only on tangible cost savings, it is probable that a statewide telecommunications system would pay for itself within a seven year time frame.

States that have incorporated modern telecommunication systems into daily operations have experienced savings in travel expense of 15% to 25% in addition to productivity increases of over 50%. Currently, the State of Indiana expects to save "...\$34 million of taxpayer money over 10 years..." through operation of an integrated state telecommunications system; Ohio expects to save "...\$5 million per year over the 15 year life of its system..." and Georgia expects to save "...over \$1 million a year...."

Based on the experience of other states, it is anticipated that any similar network established in Nevada would be a combination of existing leased, state owned and private facilities.

States that have already implemented telecommunications networks have experienced savings while services have been expanded.

Government is an intensive information business heavily and irrevocably dependent on technology to deliver services. The benefits that Nevada can accrue from deploying a statewide voice, data and video network can be represented by the three E's: Education, Economic Development and Efficiency.

EDUCATION: An integrated voice, data and video network would bring the enrichment and variety of large school districts, community colleges and the university system to the local community. It would address critical educational needs efficiently and universally by providing:

- * Expanded access to higher education for:
 - Students restricted by location or time
 - Specialty courses (engineering, medical, law enforcement)
 - Continuing professional education
- * Linking higher education to the public school system and providing interagency instructional services including:
 - Advanced and specialty courses (math, science, humanities and foreign language)
 - Continuing education for teachers for both professional development and advanced degrees
 - Occupational educational opportunities
- * Fostering communications, including:
 - Intercampus communications
 - Data transfer and information access
 - Enrichment programs (plays, arts, music, special topics)
- * Expanded access to powerful computing resources for research and development.
- * The catalog databases of Nevada's public, university, and community college libraries are all connected by packet switch technology, making collections of all libraries searchable from any library in the state. Enhanced telecommunications capability will assist in enabling libraries to extend this system into the homes of Nevada's citizens as well as improve the capacity and reliability of the existing networks.

ECONOMIC DEVELOPMENT: In the business world, companies that recognize and adopt to fundamental changes in how business is conducted invariably create a competitive advantage for themselves. The types of business and industry that Nevada is recruiting require the ability to access a variety of data sources, to transmit and receive high speed data and to provide ongoing training and development to their employees. An integrated network would give Nevada a competitive advantage in recruiting these companies as well as demonstrating the progressive management and leadership of the state. If such a network resulted in just 5% more business relocations to Nevada, it would mean an additional 400 primary and secondary jobs for the state.

EFFICIENCY: In a geographically large state like Nevada, the opportunities for government to cut costs and save employee time by deploying a statewide, integrated telecommunications network are abundant. For example:

- * Police Officers Standards and Training (POST)
Every law enforcement officer receives 16 hours of training annually on new laws and procedures. If just half of these officers can receive training locally via an interactive video network, government can save over \$70,000 annually in travel time and per diem expense.
- * Reno/Las Vegas Travel
Virtually every commercial, weekday flight between Reno and Las Vegas has several government employees on board. If just two trips a day are eliminated by using video teleconferencing, the annual savings in travel expense, per diem and lost time would be over \$100,000.
- * The Nevada legislature passed a law in 1987 allowing video arraignments. Today, the Washoe County Detention facility boasts one of the most modern fiber optic based video arraignment systems in the United States. This system links the detention facility with three courthouses in Reno and Sparks. The detention facility has two arraignment rooms linked with two-way interactive video teleconferencing to each of the courtrooms. The judge can see and talk to a defendant and the defendant can see and talk to the judge. In the time it took to transport the inmates from the old jail to the courthouse, they can now complete their arraignments. In addition, the system provides more safety to the judges and other courtroom personnel. If the prisoners were to be transported to the courthouses for arraignment, the county would have to purchase two buses at a cost of \$250,000 and they would have to hire three or four additional officers. The legislature can observe this video arraignment process by contacting the detention facility administration.
- * Government spends an enormous amount of time mailing forms, reports and other documents among various city, county and state agencies. If this information were available on a dial-up basis, hundreds of thousands of dollars in labor would be saved annually while significantly improving response times.

Shrinking budgets, new and increased demands for service and limited staffing all create a need to find more productivity with the same manpower. New telecommunications capabilities are increasingly more than just "administrative grease" for marginally improving state agency efficiency. States that have incorporated modern telecommunications systems into daily operations have experienced savings in travel expenses of 15% to 25% and have realized productivity increases of over 50%.

City, county and state governments have already identified numerous applications for an enhanced telecommunications network; each application has clearly defined benefits. A statewide voice, data and video network is technologically feasible although not without a substantial investment. As advancing technologies present opportunities to improve education, economic development and efficiency in government, Nevada is experiencing heavy demands for the limited funds available to take advantage of these opportunities. It is clear that constructing a statewide network is not practical at this time. It is equally clear, however, that such systems will provide a significant portion of information distribution in the near future. In order to 1) lessen the financial commitment required, 2) mitigate the risk of an underutilized network and 3) allow city, county and state government time to gain experience in efficient utilization of an enhanced network, the ACR 68 committee recommends the legislature provide \$810,000 over a two year period for a pilot project to validate the potential of an integrated voice, data and video network. It should be noted that this pilot project would be incorporated in any subsequent, larger network. The funds would be used as follows:

Leased circuit capable of simultaneously carrying voice, data and compressed video between Reno, Carson City and Las Vegas for a two year period\$260,000

Leased circuit capable of carrying compressed video between Reno and/or Las Vegas and two rural communities for a two year period\$ 60,000

Equip five locations (Reno, Carson City, Las Vegas and two rural communities) with interactive video teleconferencing/instructional equipment\$400,000

Salary, travel and expenses for two years for a "facilitator" to assist users in the application and operation of interactive video equipment\$ 90,000

If city, county and state agency managers and officials are to provide efficient and effective public services in the years ahead, harnessing the new information technologies and resources is essential.

In addition to, and independent of, the pilot project described above, the ACR 68 committee recommends the legislature establish a centralized organization staffed with qualified personnel to manage and plan the state's telecommunications resources. Presently, management of the state's telecommunications resources is highly decentralized. Agencies employ a variety of approaches to management of telecommunications. Facilities and applications have evolved in a haphazard and uncoordinated manner. There is no source within state government to get information on new technologies or how these technologies may be applied to improve productivity and enhance service offerings. State agency managers, officials and the tax paying public deserve better.

A centralized telecommunications organization can assist agencies with:

- * Obtaining information on new technologies, applications, legislation and regulatory issues.
- * Evaluating telecommunications requirements.
- * Establishing guidelines on procurement.
- * Establishing operational procedures for efficient use of telecommunications equipment.
- * Maximizing benefits from an enhanced network.

Improved telecommunications management will contain or reduce costs by improving procurement, planning and decision making. Government and private sector companies who have reorganized their telecommunications function report savings in the order of 20%.

Nevada must simultaneously develop its technical and managerial infrastructure to apply new information technologies. The information age is a reality. If Nevada is going to continue to improve its educational institutions and economic viability we must act now.

1.0 INTRODUCTION

1.1 BACKGROUND

During the 64th session of the Nevada Legislature, Assembly Concurrent Resolution 68 (ACR 68) was passed recognizing the opportunity for enhanced educational opportunities throughout Nevada by utilizing the latest developments in telecommunications. The Department of General Services was directed to work with state agencies, local government subdivisions, public school districts, the University of Nevada System, public utilities, and private organizations in conducting a study of state telecommunications requirements to serve educational and administrative needs.

1.2 OBJECTIVES

The objectives of this study are threefold: 1) assess the demand for voice, data, and video telecommunication services among state agencies, local government subdivisions, public school districts and the University of Nevada System; 2) review alternative designs to serve the demand; and 3) recommend a course of action by the 65th Session of the Nevada Legislature.

1.3 SCOPE

Input on how a statewide telecommunications network might be used was solicited from public agencies only; no attempt was made to get input from the general public.

The network design was based on a philosophy of providing a "backbone" transmission medium accessible by any potential user for a fee. Each user would also be responsible for any expense associated with connecting the user's location to the backbone. See Section 5 (Network Connection Cost) for representative costs to connect voice, data, and video equipment to the network.

The cost shown for the backbone network is intended to give an order of magnitude cost only. Detailed engineering and construction costs are beyond the scope of this study.

1.4 METHODOLOGY

The first phase of this study entailed polling the various public agencies who would be potential users of the telecommunications backbone network to assess what services were desired, how the services would be used, where services were required and what benefits were expected.

The second phase involved summarizing the requirements of the potential users and developing design configurations that would satisfy the identified needs.

The third phase resulted in recommending a course of action for upgrading Nevada's telecommunications capability.

1.5 CONCURRENT TELECOMMUNICATIONS STUDIES

At the present time there are several studies and directives in addition to ACR 68 that have addressed communications in various degrees. These studies and directives all take a slightly different approach, and address different aspects of state and local government communications.

AB 352. This bill, passed in the 1987 session of the legislature, calls for a study of state and local government communications "...for the development of a statewide system of radio communications for use by political subdivisions and state and local entities for emergency management." The study must: Identify deficiencies, propose a system to satisfy needs for 10 years beyond the end of the study, and meet provisions of the FCC. A fund was established for carrying out this and other provisions of the bill. Funding was ultimately placed under AB 719.

AB 719 creates a surcharge for radioactive waste received in Beatty. Appropriated from this surcharge fund is \$200,000 for "...a study concerning the development of a statewide system of radio communications for use in emergencies related to the transportation of hazardous materials in the State." Such incidents involve local, state, and federal governmental agencies.

NRS 414 describes the responsibilities of the Division of Emergency Management. It provides for the rendering of mutual aid among political subdivisions of the state and with other states in cooperation with the Federal government for carrying out the functions of emergency management. These functions include coordinating communications.

The Governor's "Emergency Management Administrative Order 2" directs that Division of Emergency Management to develop plans for a coordinated statewide communications network, utilizing all existing systems in time of emergency. The director shall be assisted by those agencies who have communications responsibilities under the state plan.

"Emergency Management Administrative Order 10" directs the director of the Department of Motor Vehicles to "...prepare state emergency plans and develop preparedness programs designed to provide basic communications, assistance to local law enforcement officials, and control traffic at disaster sites."

The Federal Communications Commission has adopted docket 87-112 which asks for a study to develop a national telecommunications plan dealing with public safety two-way radio needs. This study is to consider local, state and federal communications and inter-operability among them. The study is called for because of the inefficient use of existing frequencies, and the inability of many public safety agencies to communicate with each other during emergencies. FCC has made a virgin portion of the frequency spectrum available to use upon completion of the planning effort. Many areas of Nevada have a frequency congestion problem that can be alleviated through planning and use of these newly available frequencies.

These studies and orders all address two-way radio systems at local and state levels, with emphasis on the need to have coordinated communications during emergencies. The studies and orders all direct different organizations to take active roles in developing these plans and communications systems. No one seems to be doing anything that really allows inter-operability among the various agencies during emergency operations. There must be a definite focal point for efforts of this nature.

2.0 REQUIREMENTS ASSESSMENT

In the summer of 1987, the Director of General Services formed two committees to provide input to the ACR 68 Telecommunications Study. Eugene Paslov, the State Superintendent of Public Instruction, was requested to establish a "Telecommunications User Group" and prepare a report of telecommunications user needs. Chuck Slavin, a former member of the PSC staff, was asked to assist Mr. Terry Sullivan, the Director of General Services, to address technical requirements of the study and to act as chairman of the technical committee (the "user" committee and "technical" committee members are listed in Section 9 of this document).

Jointly, the two committees developed a telecommunications survey questionnaire designed to identify the type, quantity and location of telecommunications services desired and technical data necessary to develop a statewide telecommunications system.

2.1 OBJECTIVES AND SCOPE:

OBJECTIVE: Identify all applications of voice, data, video and radio communications that would improve the cost effectiveness, or enhance services offered by city, county, state and educational entities.

SCOPE: Work with various state and local government agencies, public school districts, University of Nevada system and law enforcement agencies and communities to identify intrastate telecommunication transmission requirements. Assessment of requirements will not be limited by known budgetary constraints.

2.2 METHODOLOGY

In December of 1987 the completed survey questionnaire was mailed to:

- All Nevada School Districts (17)
- The University of Nevada System Office (1)
- The University of Nevada Campuses (6)
- The Nevada Association of Counties (1)
- The Nevada League of Cities (1)
- All Major State Executive Agencies (41)

Instructions were transmitted with the questionnaire and a contact person identified within the State Department of Education to assist survey recipients in completing the questionnaire.

It should be noted at this point that the Legislative Counsel Bureau, Research Division, had conducted an earlier telecommunications survey at the request of Assemblyman Robert Craddock. This survey was completed by forty-one (41) state agencies and established the background and design for the current, more comprehensive review of the telecommunication user needs of this state.

Additionally, the Executive Directors of Nevada Association of Counties and the Nevada League of Cities agreed to coordinate the completion of the survey instrument among their membership. This procedure generally took the form of key individuals representing these organizations around the state being identified to fill out the survey instrument and return their findings to the Executive Directors of the statewide organization. The major user needs of the counties and cities were identified in this procedure. The completed surveys were then forwarded to the Department of Education for compilation and analysis.

A very important part of the plan included the Department of General Services working with the public utilities, in both northern Nevada and southern Nevada, to conduct information seminars and demonstrations of telecommunication technology. They also showed what and how the utilities could support the needs of a statewide backbone communications network. User group representatives were asked to attend these sessions in an effort to help them better understand some of the possibilities of the emerging telecommunication technology. At the meetings, the attendees were given material suggesting what a statewide network might provide in services, benefits and savings as well as providing some questions to be considered when filling out the ACR 68 survey questionnaire.

2.3 RESULTS

The entire survey results are included in this document as Section 8.0. The user committee report is included in its entirety as Section 10.1.

Many of the findings resulting from the survey instrument are reported just as they were originally stated. It was the committee's view that leaving the statements in an unedited form helps the reader of this report appreciate the specific thoughts of the users and provides a realistic assessment, e.g. what telecommunication users feel they really need.

The survey was completed by 76% of those who received it. This rate of return assures a high rate of confidence in the survey results. There are several major findings which are not meant to be all inclusive, but rather illustrative of the needs of the telecommunication user group community:

1. While there is already in place a statewide data transmission network, users clearly are demanding improved technology which will allow more data to be transmitted and data to be exchanged faster.
2. It was discovered that while the University of Nevada's existing data communication infrastructure is extensive connecting both main university campuses, all community colleges, and three Desert Research Institute sites into one network, the voice trunking between the various PBX and centrex switches, external video capability, and high speed data between campuses is lacking. The University however, among all of the agencies surveyed in the state, has already planned for, and in some cases has underway, statewide and nationwide network service projects that encompass the three areas of voice, video and data technology, as well as delivery to the public, to special education teachers, to university professors, to researchers, to students and administrators. (See a cross section of 11 of the Universities projects detailed in Section 10.1, and a set of diagrams titled "UNS SYSTEM LANS, DECEMBER, 1987" in Figure 3.2 - 3.9.)
3. Users throughout the state, in virtually all organizations, expressed a need for interactive video for conferencing, for instruction, and for training.
4. There appears to be a lack of effective coordination of telecommunication networking within agencies. Critical decision making regarding equipment, training, and informative access is highly decentralized and uneven in the level of expertise available.
5. As users become more aware of the potential use of facsimile technology there is increased demand for this form of telecommunications.
6. Survey respondents identified benefits expected from improved telecommunications services. These benefits, stated in different ways but repeated over and over again, revolve around three areas: Cost reduction, time savings and enhanced services.

3.0 EXISTING NETWORKS

The substantial telecommunications demand of city, county, and state governments has been demonstrated in section 2.0. A logical place to begin evaluating how this demand might be served is to review what resources are available today. Four existing networks that may have the potential to satisfy at least part of the demand are reviewed below. One of those, the UNS system, demonstrates what these new services can provide and illustrates that we have the capability within Nevada to develop and provide these services.

3.1 STATE MICROWAVE

The state microwave system provides voice, data and radio control channels among 30 locations throughout Nevada (see figure 3.1). The system is available for use by all state and county entities, as well as the federal government, and has an ultimate capacity of 600 channels. The state microwave system is administered by the State Communications Board which is a subdivision of the Nevada Highway Patrol. The Director of the Department of Motor Vehicles and Public Safety appoints a Coordinator of Communications who carries out the policies of the Board and provides maintenance, repair and technical assistance to state agencies. The communications subdivision is funded in part by fees assessed to users of the system.

3.1.1 PRESENT USE

Presently the system is equipped with 266 channels with 123 channels used for voice, 110 used for radio control channels and 33 used for data. The majority of the channels (112) are between Reno/Carson City and Las Vegas. Of the 266 channels in use, 8 are used by county government, 24 by federal government, 3 by the University of Nevada System and 231 by the state.

3.1.2 COST

The 1988 budget for the State Communications Board was \$693,049; this figure included salaries, travel, operating expenses, equipment additions and training.

3.1.3 FEATURES AND BENEFITS

- * The capital expenditures required to build the initial system have already been made and the system is operational.

3.1.4 LIMITATIONS

- * The state microwave system is not suitable for high speed data or video services.
- * Radio based technology does not have the large capacity required to serve the demand demonstrated in the user survey.
- * Maintenance and operating expenses are higher for radio systems than for fiber optic based technology.

3.2 INSTRUCTIONAL TELEVISION FIXED SERVICE (ITFS)

ITFS is a type of television broadcast that was established by congress to serve educational needs. ITFS is similar in operation to standard television broadcast with the primary difference being the higher frequency of transmission requires a special antenna and "down-converter" in order to receive the broadcast signal on standard television sets.

3.2.1 PRESENT USE

There are presently two ITFS systems in Nevada. One system is licensed by the FCC to the Clark County School District and has been in operation for approximately 20 years. This system provides programming over four channels to the school district and, through an agreement with Channel 10 (a Public Broadcast Station) to the community at large including portions of Lincoln and White Pine Counties. Future plans call for including UNLV and CCC in the ITFS system in Clark County.

The second system is licensed to the University of Nevada Board of Regents and is operated by UNR. This system is under construction and is expected to be operational by January 1989 with general coverage in the Reno/Sparks, Carson City and Minden/Gardnerville areas. UNR anticipates providing programmed instruction to off campus locations, including primary and secondary schools, state agencies and industry.

3.2.2 COST

A complete ITFS system can be established for about \$150,000. This cost will go up as additional repeater and transmitter sites are added and does not include the antenna/down converter required at receive sites nor does it include operating expenses. However, a substantial portion of required ITFS funding is available from the U.S. Department of Commerce (via the National Telecommunications and Information Agency).

3.2.3 FEATURES AND BENEFITS

- * University courses and other offerings can be offered simultaneously both on and off campus thereby reducing expenses for travel and instruction. Programs can be offered at various times throughout the day to fit user schedules.
- * ITFS systems are relatively inexpensive to own and operate with federal funding available. Up to four channels are available per system providing a variety of simultaneous program material.

3.2.4 LIMITATIONS

- * Coverage is limited to "line of sight" locations within an approximate 20 mile radius of transmitter locations. Special equipment is required for reception (antenna/down converter) at a cost of approximately \$500/site.

3.3 UNIVERSITY OF NEVADA NETWORK (UNS NETWORK)

The UNS NETWORK provides data services within and between all campuses of the University of Nevada System, connecting 11 sites via central hubs in Reno and Las Vegas. These sites are, UNR, UNLV CLARK COUNTY COMMUNITY COLLEGE, CHEYENNE AND HENDERSON CAMPUSES, WESTERN NEVADA COMMUNITY COLLEGE, CARSON AND FALLON CAMPUSES, NORTHERN NEVADA COMMUNITY COLLEGE AT ELKO, TRUCKEE MEADOWS COMMUNITY COLLEGE AT RENO, DESERT RESEARCH INSTITUTE SITES AT DANDINI PARK RENO AND STEAD, AND THE CHANCELLOR'S OFFICE IN RENO. The network is composed of an integrated combination of public utility dial and lease lines, State of Nevada Microwave circuits and University owned lines and cable. It was designed, installed and is operated and managed by the University of Nevada's System Computing Services telecom group for use by the entire population of University of Nevada System.

3.3.1 PRESENT USE

The UNS Network supplies data connectivity between university campuses with Local Area Networks, (LANS) at up to 56,000 bits per second, and up to 10,000,000 bits per second within these campuses. (See Fig. 3.2 - 3.9 for campus LAN configurations.) The Reno to Las Vegas speeds are at 9600 and 2400 bits per second as well as to Northern Nevada Community College at Elko. The network presently serves more than 25,000 university users statewide comprising students, faculty, researchers, and administrators, connecting them to seven computer systems operated by University of Nevada System Computing Services (UNSCS) and to more than eight of the campus operated computer systems.

3.3.2 COST

The public utility leased and dial lines and the State of Nevada Microwave circuit recurring costs are approximately \$75,000 annually. All other operating costs including salary, maintenance, training, and travel are approximately \$250,000 annually.

3.3.3 FEATURES AND BENEFITS

All University of Nevada computer users statewide have equal access to all of the more than 15 computers connected to the network wherever they are located within the university system. The system connects students, faculty, researchers and administrators simultaneously and allows resources that exist only one place in the university system to be used by any user from anywhere within the system.

3.3.4 LIMITATIONS

The system only serves data needs between campuses. It supports video only within the campuses that have broadband LANS. The Reno/Las Vegas speed and bandwidth is too little and too slow as is access to Elko. The network has no connectivity to smaller communities that require services from the university. Voice, video and data services need to be enhanced and added to all Nevada communities.

3.4 VIDEO SATELLITE COMMUNICATIONS

A video satellite communications system consists of an earth bound microwave transmitter aimed at a satellite in synchronous orbit (the satellite appears to be fixed above a permanent location on the equator) around the earth. The satellite has the ability to receive a signal and retransmit that signal to a wide area of the earth's surface. Appropriate microwave receivers collect the signal and down convert it to video.

3.4.1 PRESENT USE

Currently several schools in White Pine and Lincoln counties receive live classroom material via satellite. The Studios where the programs originate have toll free, 800 phone numbers whereby students in individual classrooms can call in with questions. This enables an instructor to offer live lessons over a wide geographical area, to a number of classrooms, without having to be physically present. Other schools receive broadcast information which is videotaped and shown to classes, without having the interactive capability.

3.4.2 COST

Video satellite receiving systems are relative inexpensive, as we see with the many systems that have been purchased for home use. The receiving system can cost somewhere between \$3,000 and \$5,000 per installation. The transmitting system, or uplink, will cost in the order of \$450,000. The rental cost for the satellite itself is between \$250 and \$300 per hour. Additionally, small video studios are required, such as exist on most UNS campuses. For other locations, it would require equipping a studio with the appropriate television cameras and lighting systems, etc., in the amount of about \$20,000.

3.4.3 FEATURES AND BENEFITS

The principal feature of a video satellite system is the ability to disseminate information over a wide area at a relatively low cost. Schools can contract with organizations that provide the programming, the classroom materials, and the satellite time for a fixed price per student. This is relatively cost effective in rural schools with small populations and the problem of acquiring quality teachers.

3.4.4 LIMITATIONS

For the services identified by potential users of the network, a satellite system has some limitations.

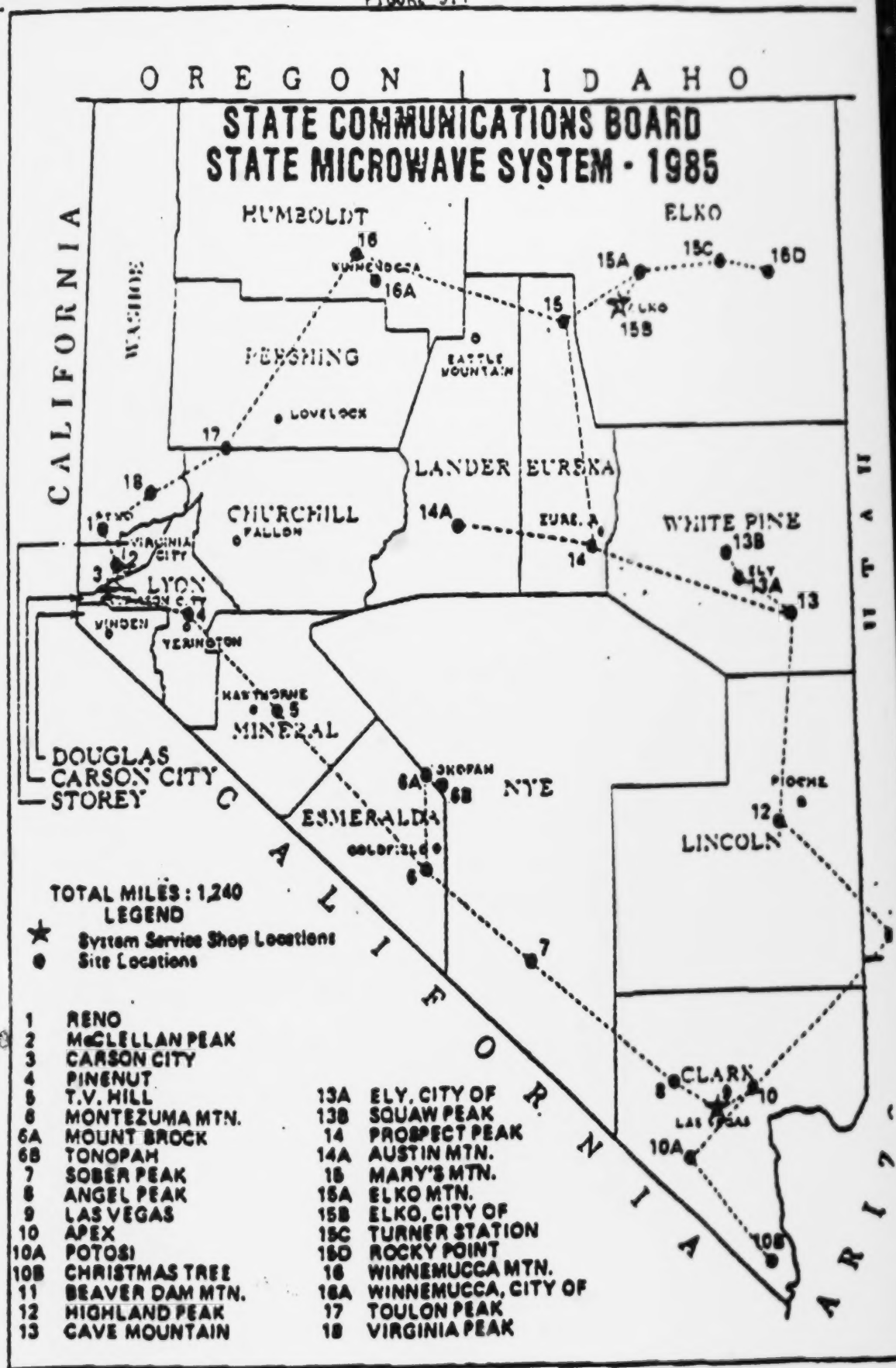


FIGURE 3.2

UNS SYSTEM LANS December, 1987

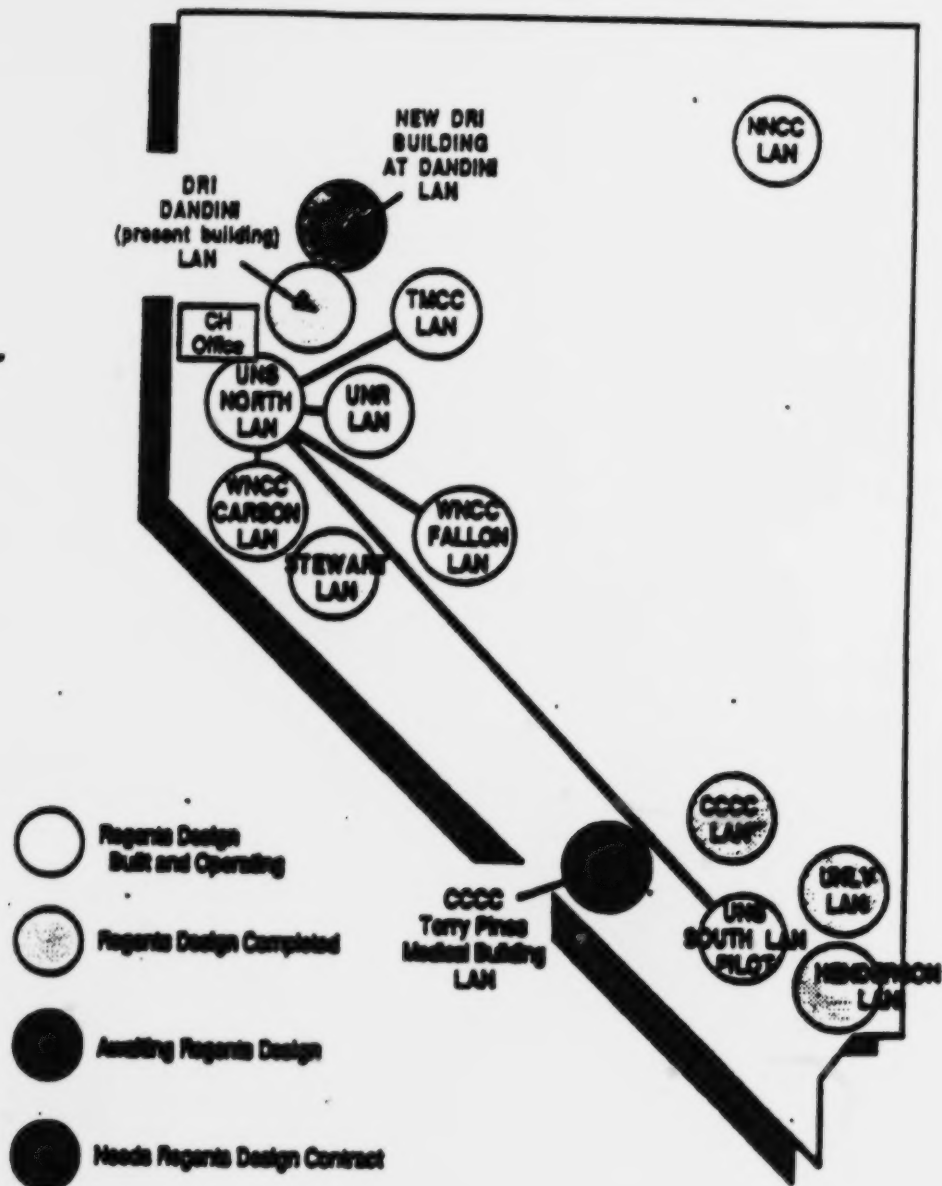


FIGURE 3.3

UNSCS/NORTH

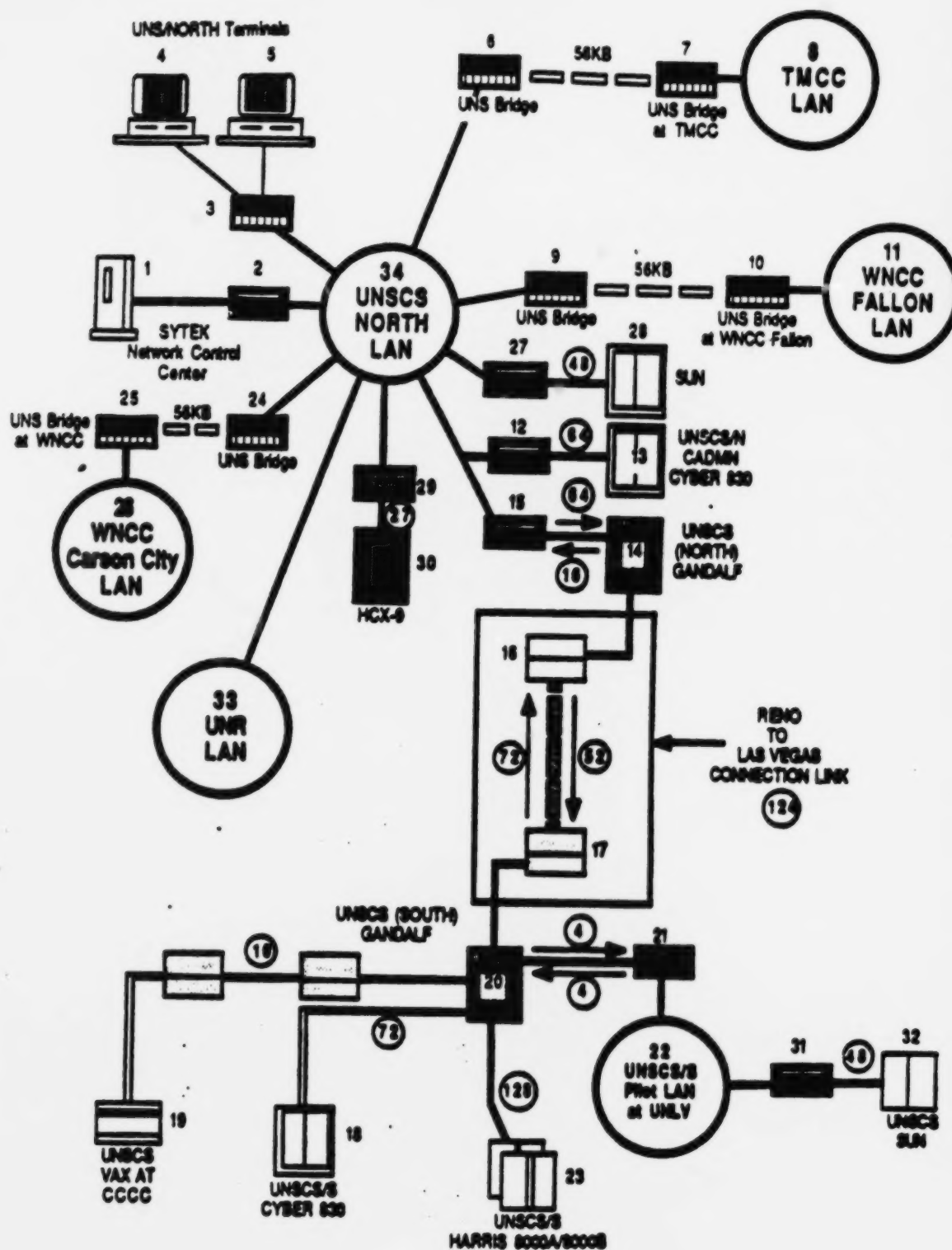


FIGURE 3.4

UNR

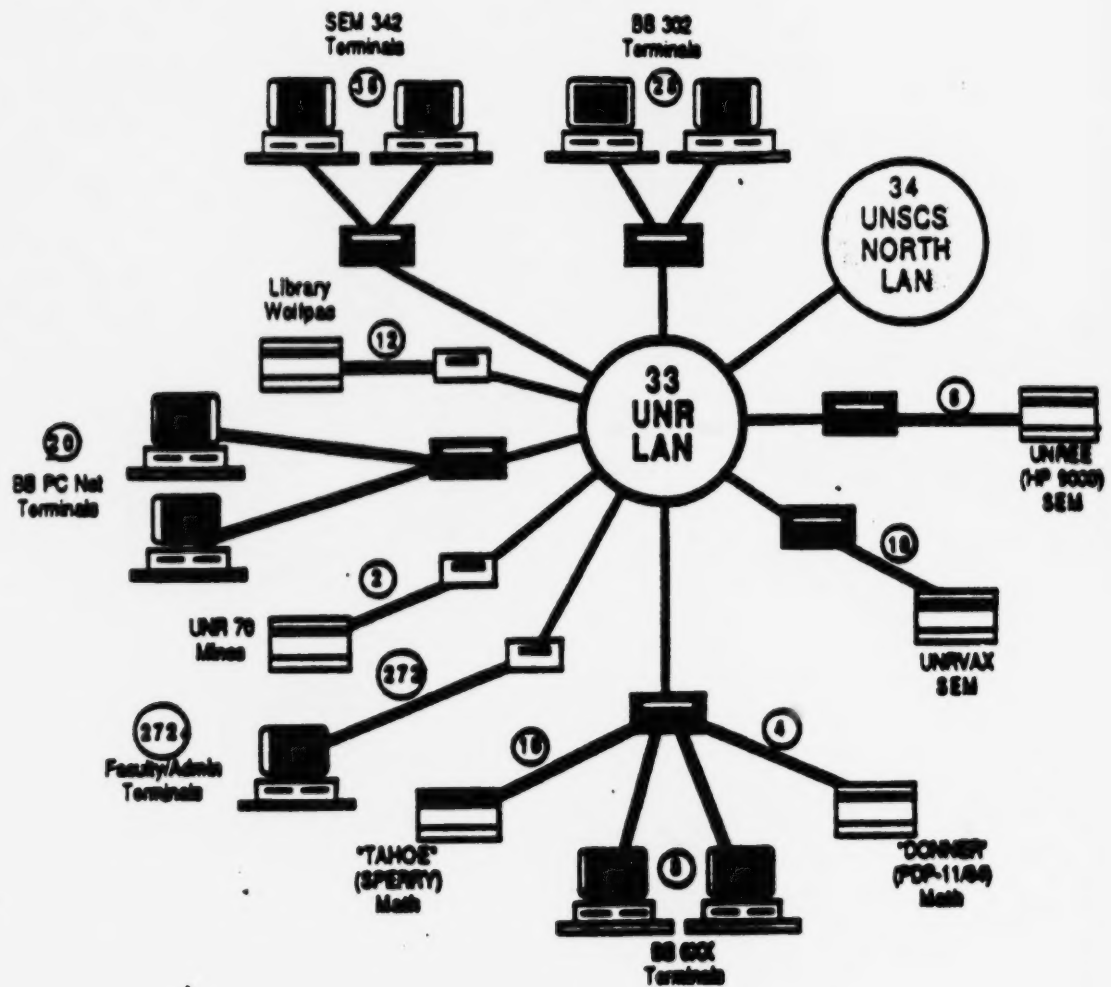


FIGURE 3.5

WNCC Carson

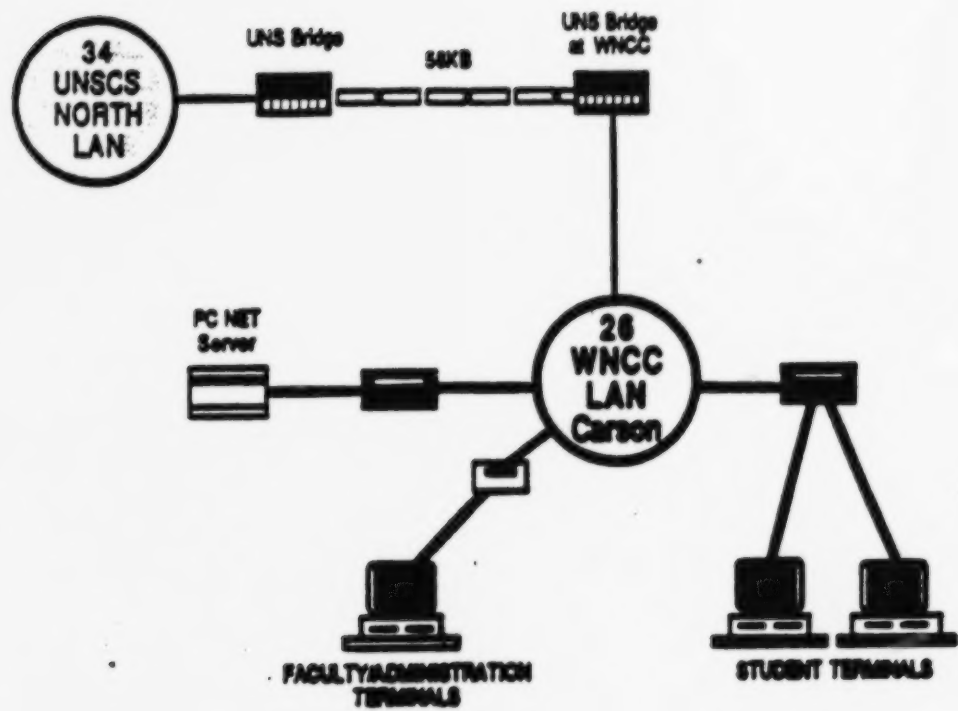


FIGURE 3.6

WNCC Fallon

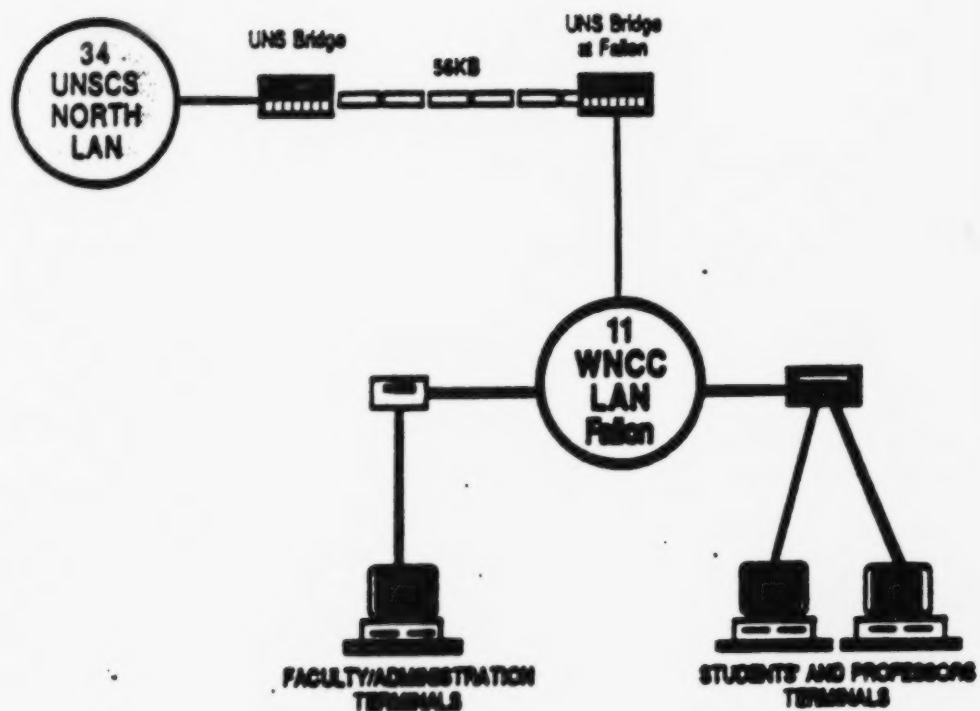


FIGURE 3.7

TMCC LAN

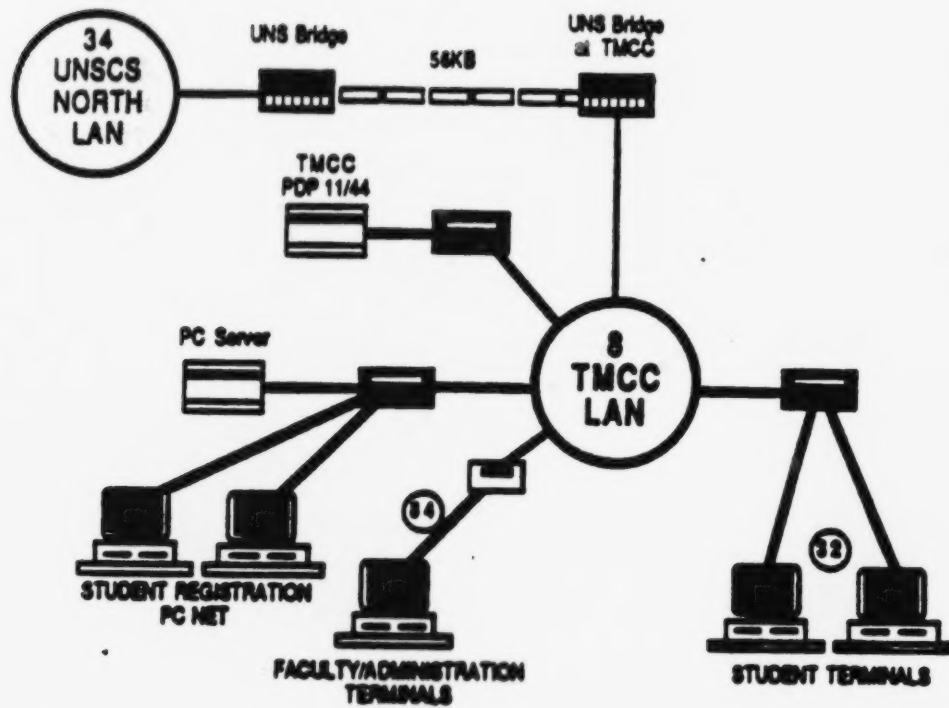


FIGURE 3.8

UNLV Pilot LAN

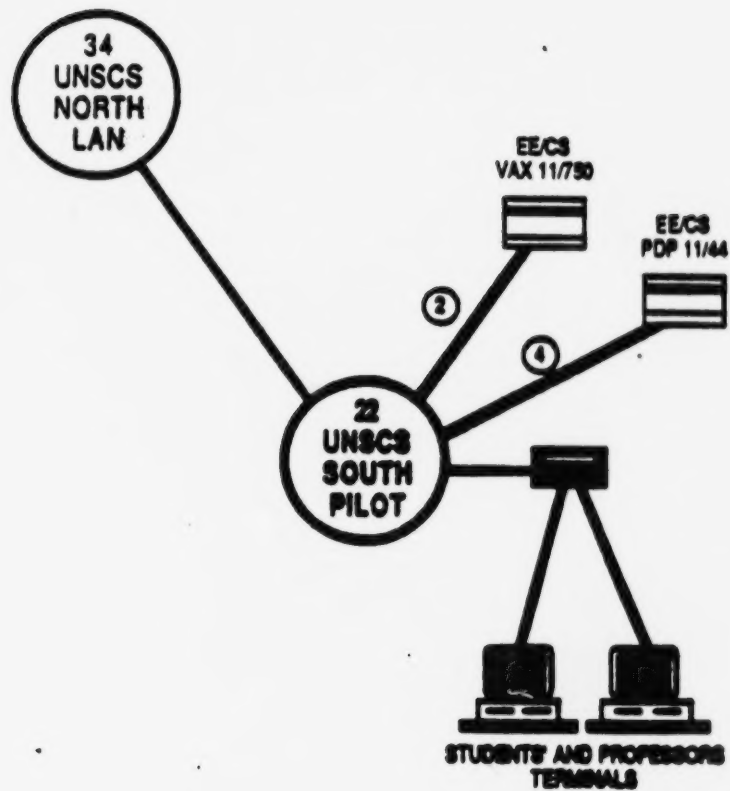


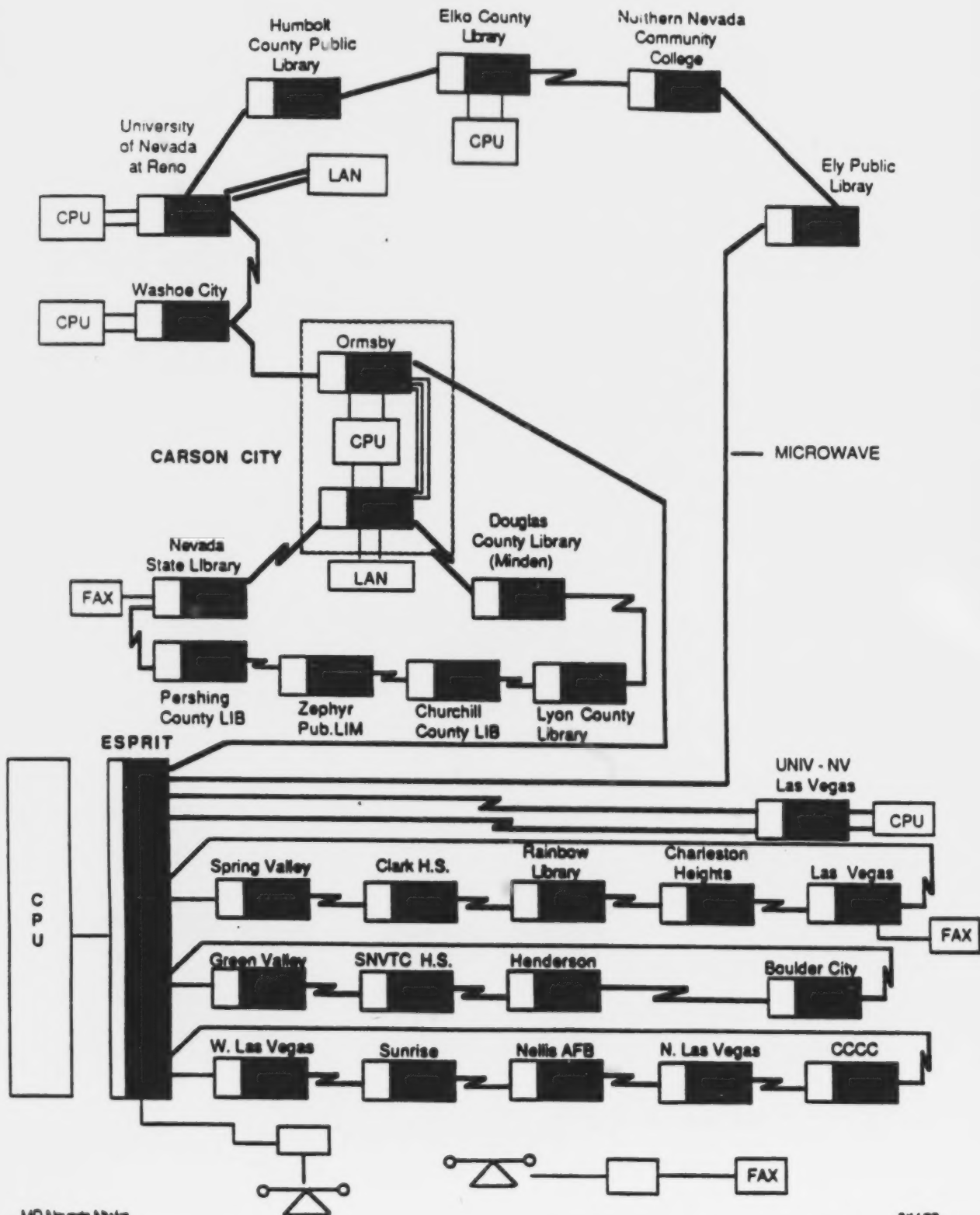
FIGURE 3.9

UNSCS LEGEND

1. System 2000 Network Control Center
2. System 2000 Multiplexor
3. System 2000 Multiplexor
4. User Terminals and/or Personal computers
5. User Terminals and/or Personal computers
6. System 2000 bridge to remote location with 56 thousand bits per second transfer rate
7. System 2000 bridge to remote location with 56 thousand bits per second transfer rate
8. TMCC LAN system
9. System 2000 bridge to remote location with 56 thousand bits per second transfer rate
10. System 2000 bridge to remote location with 56 thousand bits per second transfer rate
11. WNCC Fallon LAN system
12. System 2000 Multiplexor
13. UNSCS North Administrative Cyber 830 computer
14. UNSCS Gandalf digital switch
15. System 2000 Multiplexor
16. Modems and Statistical Multiplexors
17. Modems and Statistical Multiplexors
18. UNSCS South Cyber 830 computer
19. UNSCS South VAX 750 computer at CCCC
20. UNSCS Gandalf digital switch
21. System 2000 Multiplexor
22. UNSCS South Pilot LAN system
23. UNSCS South Two Harris H800 academic computers
24. System 2000 bridge to remote location with 56 thousand bits per second transfer rate
25. System 2000 bridge to remote location with 56 thousand bits per second transfer rate
26. WNCC Carson LAN system
27. System 2000 Multiplexor
28. UNSCS Academic SUN computers
29. System 2000 Multiplexor
30. UNSCS Academic/Research Harris HCX9 computer
31. System 2000 Multiplexor
32. UNSCS Academic SUN computers
33. UMR LAN system
34. UNSCS North LAN system

FIGURE 3.10

NEVADA LIBRARY NETWORKS



The system does not have a true interactive capability, beyond the ability to call in questions by telephone. Video satellite works most economically as a wide area (statewide) broadcast medium and is much more expensive as a system for 2-way interactive video instruction. For any network where many users need access, the cost of the satellite uplinks become excessive. The satellite receiver can receive a signal from only one transmitter at a time. Voice and data links can not function in a full duplex mode (where the earth stations have simultaneous send and receive capability). Satellites themselves have a limited life expectancy, and cost a lot to put into orbit. Sometimes, we lose the capability of putting any satellites into orbit, and failed systems cannot be replaced.

4.0 PROPOSED NETWORKS

The substantial telecommunications needs of city, county and state government have been demonstrated. Development of a statewide network is not only technically feasible, it has already been completed by many other states (see appendix 10.3). Before any network is established, many details will have to be resolved:

- * Who will have access to the network?
- * How much capacity should be provided? Larger capacity equates to more cost.
- * How will the various leased, state owned and private facilities be integrated into a statewide network?
- * Which communities will be included in the network? The more communities served the more the cost. Some of the more expensive communities to serve have the greatest need for expanded telecommunications services.
- * What rates will be charged for use of the network?
- * Should network costs include customer premise equipment cost as well as transmission medium costs?
- * Should the network be owned or leased?

It is beyond the scope of this study to make specific recommendations regarding all the design and operational aspects of a proposed statewide network. However, it is possible to develop costs for typical networks and to propose a plan for implementation. As a result of meetings with Nevada Bell and Centel and discussions with individuals from several other states where statewide networks have already been established and after assessment of statewide requirements, one network configuration was chosen in order to develop representative costs. Characteristics of this network are as follows:

- * The network will consist of a "backbone" transmission facility capable of simultaneously carrying voice, data and video information.
- * The network will be made up of leased, government owned and private facilities.
- * The network will be made available to all city, county and state entities as well as school districts and the University of Nevada System.
- * The network will support state and local government two-way radio systems.
- * To the maximum degree possible, the network will extend into all county seats and high school communities (34 communities in all).
- * Individual user organizations will be solely responsible for customer premise equipment and "last mile" (see section 5.0) costs.

The proposed network could be leased from common carriers or built and operated by the state. Cost figures for these two scenarios are explored further below. In order to develop these costs, it was necessary to make numerous assumptions. Changes to any one of these assumptions could significantly alter the costs shown.

4.1 LEASED NETWORK

Today, the telephone industry provides the vast majority of the communications needs of city, county and state government. The industry does not now have the capability to provide all of the desired services in all of the locations identified in this study.

Nevada Bell, on behalf of the telephone industry, has presented a report (see section 10.2 for a copy of the report) to General Services outlining planned construction of transmission facilities that will allow desired telecommunications services in all but 5 identified communities at the end of three phases of construction activity. All communities in the report were identified as either "A", "B", or "C" locations. "A" cities will have access to voice, high speed data and full motion, interactive video. "B" cities will have access to voice, high speed data and full motion, interactive compressed video. "C" cities will have access to voice and low speed data (as they do today). Budgetary prices for voice data and video services were also included in the report. It should be understood that individual agencies may have needs not addressed by a backbone network.

In the analysis that follows, representative costs are developed for voice, data and video services leased from the telephone industry for each of the three phases of construction outlined in Nevada Bell's report. Rates shown for leased services are budgetary only. Any final prices, terms or conditions will be subject to regulatory approval. Construction schedules are based on current plans and are negotiable.

4.1.1 COST

4.1.1.1 PHASE ONE (Available 1988)

Phase one represents the telephone industry network as it exists today. Services could be available within 12 months of a signed contract. "A", "B" and "C" cities as described above are:

"A" Cities	"B" Cities	"C" Cities
Carson City	Incline Village	Gabbs
Reno	Virginia City	Tonopah
Fernley	Zephyr Cove	Carlin
Lovelock	Minden	Wells
Winnemucca	Dayton	Austin
Hawthorne	Yerington	Eureka
Las Vegas	Fallon	Ely
Henderson	Gerlach	Panaca
Boulder City	McDermitt	Alamo
	Battle Mountain	Moapa Valley
	Elko	Lund
	Beatty	
	Indian Springs	
	Pahrump	

The three areas of cost associated with use of a statewide network are transmission use, customer premise equipment and, in some cases, last mile costs. As mentioned earlier, customer premise equipment and last mile cost are the responsibility of individual user organizations and therefore cost data is not developed here. These costs are discussed in general terms in section 5.

VOICE (PHASE I)

Cities and counties presently route virtually all of their intrastate calls over facilities owned by Nevada telephone companies. The state uses these facilities as well as the state owned microwave network. An estimated 474,000 calls at an average length of 4 minutes are made every month by city, county and state entities. Nevada Bell, as designated carrier for intrastate calls in most of Nevada (essentially all of Nevada excluding the Clark County area) has proposed a rate, that if approved by the Public Service Commission, would allow charging cities, counties and states approximately 2% less than they are now charged. It is assumed that a similar rate could be achieved within the Clark County area and between Northern Nevada and Southern Nevada. The total monthly charges for voice transmission would be approximately \$80,000 less than today.

Customer premise equipment required for voice transmission consists of telephones, key systems and PBX's. Most users would likely already have this equipment in place.

Last mile charges would be included in existing local telephone service rates.

DATA (PHASE I)

It has been estimated that 72 data circuits (transmitting at 56 kilobit per second rate) are sufficient to satisfy initial city, county, and state needs. This capability is available in all "A" and "B" cities. At an average circuit length of 250 miles and charges of \$16 per mile per month for a group of 24 circuits and \$12 per month to connect individual circuits, the total monthly charges for high speed data is estimated as:

$$\begin{array}{rcl} 3 \times 250 \times \$16 & = & \$12,000 \\ 72 \times 12 & = & \underline{874} \\ & & \$12,874 \end{array}$$

Customer premise equipment required to send and receive high speed data may consist of computers, PBX's and multiplexers.

Last mile charges are included in the above rate.

COMPRESSED VIDEO (PHASE I)

Compressed video provides all the capability required for video teleconferencing and interactive instructional video. It may not be appropriate for transmitting programs where there is a great deal of motion (such as sporting events). The primary advantage of compressed video is that it requires only 1/28 of the transmission capacity of full motion quality video. Compressed video is available in "A" and "B" cities. It has been estimated that 4 compressed video circuits among the "A" and "B" cities would serve near term demand. For an average length of 250 miles, the monthly transmission cost would be:

$$4 \times 250 \times \$16 = \$16,000$$

Most potential users of interactive video do not now have the necessary customer premise equipment (including cameras, television sets, video compression and other equipment) required to transmit and receive video signals. Representative cost for this equipment is presented in section 5.3. It is anticipated that this equipment would be owned by the respective users or pooled for use by all at common locations.

FULL MOTION VIDEO (PHASE I)

Full motion video is the same quality as is received from television stations. One circuit among the "A" cities would be charged at \$104 per circuit mile per month plus \$990 per month. The estimated monthly cost for a 600 mile network would be:

$$1 \times 600 \times \$104 + \$990 = \$63,390$$

As with compressed video, users must acquire the necessary cameras, televisions sets and other equipment required to transmit and receive video signals. The exception to compressed video is that additional equipment to compress the signal from broadcast quality is not required.

Due to the large transmission capacity requirements of broadcast quality video, special "last mile" facilities are needed from the telephone company to the user location. See section 5.4 for an estimate of these costs.

The total monthly cost to the city, county and state government for voice, data and video transmission in phase one is \$12,264 more than is spent presently for voice only.

4.1.1.2 PHASE TWO (Available 1991)

Phase two of the Nevada telephone industry network would be available 24 months after a contract was signed (or as early as 1991). The "A", "B" and "C" cities under phase two are:

"A" Cities	"B" Cities	"C" Cities
Carson City	Incline Village	Gabbs
Reno	Virginia City	Carlin
Fernley	Zephyr Cove	Wells
Lovelock	Minden	Austin
Winnemucca	Dayton	Eureka
Hawthorne	Yerington	Ely
Las Vegas	Fallon	Panaca
Henderson	Gerlach	Alamo
Boulder City	McDermitt	Moapa Valley
Battle Mountain		Lund
Elko		
Beatty		
Indian Springs		
Pahrump		
Tonopah		

VOICE (PHASE II)

With 3% growth per year, the cost for voice transmission would be approximately \$88,000 less than would be experienced without the proposed rate reduction.

DATA (PHASE II)

Phase two data requirements are estimated at 96 circuits with an average length of 250 miles:

$$\begin{array}{rcl}
 4 \times 250 \times \$16 & = & \$16,000 \\
 72 \times \$12 & = & \underline{874} \\
 & & \$16,874
 \end{array}$$

COMPRESSED VIDEO (PHASE II)

The cost for 8 compressed video circuits at an average length of 250 miles is:

$$8 \times 250 \times \$16 = \$32,000$$

FULL MOTION VIDEO (PHASE II)

Full motion video cost is estimated at:

$$1 \times 700 \times \$104 + \$1650 = \$74,050$$

The total monthly cost to city, county and state government for voice, data and video transmission in phase two is \$34,924 less than would be experienced without the proposed rate reduction in voice service.

4.1.1.3 PHASE THREE (Available 1997)

Phase three of the Nevada telephone industry network is planned for 1997 although earlier deployment is possible subject to negotiation. For phase three, communities are categorized as follows:

"A" Cities

Carson City
Reno
Fernley
Lovelock
Winnemucca
Hawthorne
Las Vegas
Henderson
Boulder City
Battle Mountain
Elko
Beatty
Indian Springs
Pahrump
Tonopah
Gabbs
Austin
Eureka
Ely

"B" Cities

Incline Village
Virginia City
Zephyr Cove
Minden
Dayton
Yerington
Fallon
Gerlach
McDermitt
Lund

"C" Cities

Carlin
Wells
Panaca
Alamo
Moapa Valley

VOICE (PHASE III)

With 3% growth per year, the estimated cost for voice use would be approximately \$104,000 less than would be experienced without the proposed rate reduction.

DATA (PHASE III)

Phase three data requirements are estimated at 144 circuits with an average length of 250 miles:

$$\begin{array}{rcl} 6 \times 250 \times \$16 & = & \$24,000 \\ 96 \times \$12 & = & \underline{1,152} \\ & & \$25,152 \end{array}$$

COMPRESSED VIDEO (PHASE III)

The cost for 10 compressed video circuits at an average length of 250 miles is:

$$10 \times 250 \times \$16 = \$40,000$$

FULL MOTION VIDEO (PHASE III)

Full motion video is estimated at:

$$1 \times 1100 \times \$104 = \$2090 = \$116,490$$

The total monthly cost under phase three is: \$77,642 less than would be experienced without the proposed rate reduction in voice service.

4.1.2 FEATURES AND BENEFITS

- * A network leased from others minimizes the need for large initial capital expenditures.
- * The leasor would maintain the network 24 hours a day, 7 days a week.
- * The quality and availability of a leased network would likely be the same as today's public network.
- * A leased network eliminates the need for additional real estate and/or floor space.
- * Network design and construction would be administered by the leasor.

4.1.3 LIABILITIES

- * Ultimate control of a leased network is in the hands of others.

4.2 STATE OWNED NETWORK

A state owned network would be built and operated by the state and used by city, county and state government as well as local school districts and the University of Nevada System. Cost data for a state owned network similar in scope to the leased network is developed below.

4.2.1 COST

PHASE ONE

The final design for any state owned network would be based on several factors including present demand, future demand, system capacity expected route, reliability, maintainability, first cost and annual operating costs to name a few. Although no detailed engineering design work was attempted, it is anticipated that the network would largely consist of fiber optic technology with some digital microwave radio both of which would be integrated with telephone company services where appropriate. A characteristic of data and video service is that the number of required connections for any particular user are generally few in number and between predetermined locations. Voice service, on the other hand, requires the user be able to connect to virtually every other user at any time on a moment's notice. This requires sophisticated switching equipment that could easily double the cost of a backbone network. Since the greatest benefit to city, county and state government would come from improved data and video services, the state owned backbone does not include switching equipment costs to add voice service.

Phase one of a state owned network was designed to provide data and compressed and full motion video service to all "A" cities of the phase one leased network alternative plus any "B" or "C" cities that could reasonably be served along the way. A state owned network could be available within 6 to 12 months from the time a contract is awarded for construction. Cities in the phase one network are:

Carson City	Las Vegas	Yerington
Reno	Henderson	Beatty
Fernley	Boulder City	Indian Springs
Lovelock	Virginia City	Tonopah
Winnemucca	Minden	Dayton
Hawthorne		

With a leased network, the total annual transmission cost is the sum of the charges assessed by the industry for data, compressed video and full motion video services. With a state owned network, the total annual transmission cost for all services is the annualized cost for construction and operation. The charges for different types of network use could be based on cost allocation, value of service or other policy considerations.

Phase one is estimated to incur \$14,000,000 in capital costs and require \$490,000 in annual expense for administrative and maintenance personnel and operating expense.

As stated earlier, individual users are responsible for any customer premise equipment required to connect to the network (see section 5). Unlike a leased network, last mile charges would be applicable for any use of the state owned network.

PHASE TWO

Phase two of a state owned network was designed to provide data and compressed and full motion video service to all "A" cities of the phase two leased network alternative plus any "B" or "C" cities that could reasonably be served along the way. Cities in the phase two network are:

Carson City	Las Vegas	Yerington
Reno	Henderson	Beatty
Fernley	Boulder City	Indian Springs
Lovelock	Virginia City	Tonopah
Winnemucca	Minden	Dayton
Hawthorne	Incline Village	Zephyr Cove
Fallon	Gerlach	McDermitt
Battle Mountain	Elko	Pahrump
Carlin		

Phase two is estimated to incur an additional capital cost of \$6,450,000 and require a total of \$560,000 in annual expenses.

PHASE THREE

Phase three of a state owned network was designed to provide data and compressed and full motion service to all "A", "B" and "C" cities of the phase three leased network alternative. Cities in the phase three network are:

Carson City	Las Vegas	Yerington
Reno	Henderson	Beatty
Fernley	Boulder City	Indian Springs
Lovelock	Virginia City	Tonopah
Winnemucca	Minden	Dayton
Hawthorne	Incline Village	Zephyr Cove
Fallon	Gerlach	McDermitt
Battle Mountain	Elko	Pahrump
Carlin	Gabbs	Wells
Austin	Eureka	Ely
Panaca	Alamo	Moapa Valley
Lund		

4.2.1.3 COST (PHASE III)

Phase three is estimated to incur an additional capital cost of \$11,000,000 and require a total of \$580,000 in annual expenses. Total construction cost for the three phases is estimated at \$31,450,000. Actual costs could vary from \$25,000,000 to \$40,000,000.

4.2.2 FEATURES AND BENEFITS

- * An "owned" network allows total control over the design, operation, use and rates charged.
- * A fiber optic cable would provide all transmission capacity that city, county and state government will need for the foreseeable future.
- * Full motion video would be cheaper to provide than compressed video and would likely be available system wide.
- * Since there is no technology on the horizon that is likely to replace fiber optics, the useful life of a fiber optic system should be at least 20 years.

4.2.3 LIMITATIONS

- * A state owned network requires a large initial capital expenditure to become operational.
- * Equipment rooms (approximately 100 sq. ft. each) will be required in each community served by the network.
- * Loss of city, county and state telecommunications traffic volumes on the public network may result in higher charges to remaining utility customers in order to meet utilities' authorized earning levels.

4.3 OTHER NETWORKS

Representative cost data has been developed for a network leased from the Nevada telephone industry and for a network owned and operated by the state. These are only two of the many possibilities for network deployment. There are many other options that may include any combination of leased or owned transmission capacity obtained from the Nevada telephone industry, other utilities, other telephone industry companies, private parties, etc. The alternatives are far too numerous to explore here.

5.0 NETWORK CONNECTION COST

Section 4 has addressed representative costs to transmit voice, data and video information over a backbone network. In order to utilize a transmission network, it is necessary to obtain appropriate customer premise equipment and, in some cases, to provide for the "last mile" connection. As stated earlier, individual user organizations will be solely responsible for customer premise equipment and "last mile" costs. However, for reference purposes, representative costs for typical customer premise equipment and "last mile" connections are listed below (see figure 5.1).

5.1 VOICE EQUIPMENT

Voice equipment cost (generally consisting of telephones, key systems, PBX's and facsimile machines) will remain the same regardless of who supplies the Backbone Network. (See figure 5.1.)

TYPE	ESTIMATED COST
1a. PBX Trunk	\$500 - \$1,000 per port
1b. Key System	\$200 - \$300 per station
1c. Single Telephone	\$50 - \$100 per phone
1d. Facsimile ("FAX") Machine	\$2000 - \$5000 each

5.2 DATA EQUIPMENT

The data equipment cost will vary slightly depending on who supplies the Backbone Network. (See figure 5.1.)

TYPE	ESTIMATED COST
2a. Multiplexed Data Services	
Network Service Unit	\$1000 per end
Multiplexor	\$1000 - 10,000 per end
2b. High Speed Data Services	
Network Service Unit	\$2000 per end

5.3 VIDEO EQUIPMENT

The full motion video equipment assumes fiber all the way to the end user. (See figure 5.1.)

TYPE	ESTIMATED COST
3a. Full Motion Video Equipment	
Codex Encoder/Decoder	\$17,000 per end
Camera and Monitor Equipment	\$6000 - \$10,000 per end
Sound or Audio Equipment	\$3000 - \$6000 per end

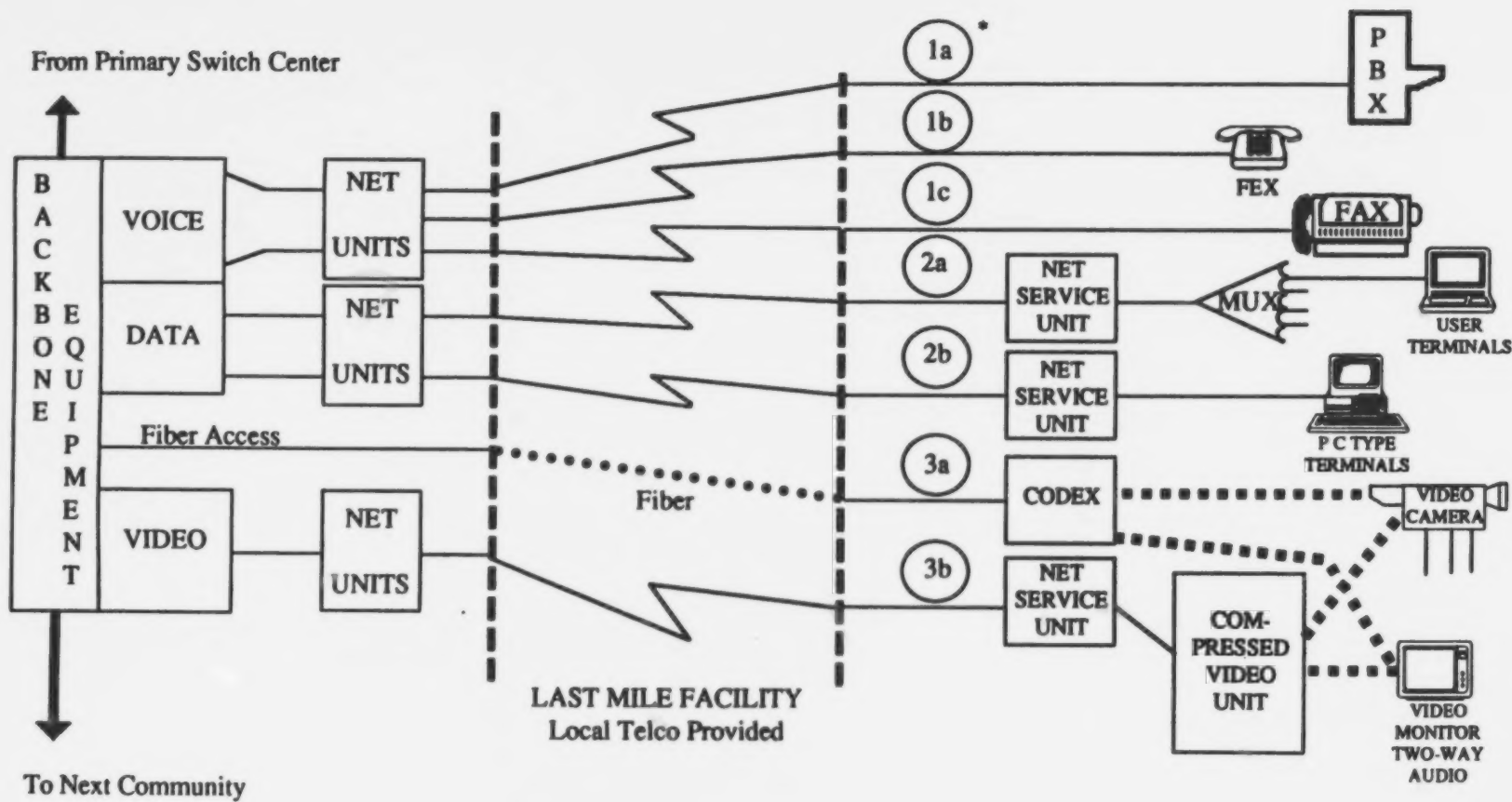
Compressed video equipment assumes T1 backbone present. (See figure 5.1.)

3b. Compressed Video Equipment	
Network Service Unit	\$2000 per end
Compressed Video Unit	\$50,000 per end
Camera and Monitor Equipment	\$6000 - \$10,000 per end
Sound or Audio Equipment	\$3000 - \$6000 per end

5.4 LAST MILE

Years ago, there was only one connection between a subscriber and the telephone company. This connection, or local loop, was provided via a pair of wires from the telephone central office to the subscriber's location. This connection not only provided the subscriber access to the only telephone service provider but was also sufficient to access all available services from that company.

TYPICAL COMMUNITY CONFIGURATION



* See page 35, Section 5.1 for reference.

Today, subscribers may have need to access any one of a number of public and private telecommunications networks. The physical connection required is not necessarily obtained from the local telephone company. In the telecommunications industry, the connection between a telecommunications network and the subscriber location is referred to as the "last mile."

For a leased network, voice, data and compressed video may still be provided over existing cable facilities that now connect city, county and state locations with the local telephone company. Due to the high transmission capacity requirement of full motion video, special connections must be made between the Nevada telephone industry network and the user location. If this transmission capacity is leased from the Nevada telephone industry, a representative cost of \$1100 per month per location would apply.

For a state owned network, the expense associated with the last mile connection applies to data and compressed and full motion video.

If this last mile connection were obtained from the local telephone company, representative monthly charges for data would be \$100 to \$500 (depending on data rate), \$500 for compressed video and \$1,500 for full motion video. These charges would apply to each "end" or location.

If the last mile connection were obtained by installing a privately owned microwave radio system with the capacity for either 24 voice circuits, 1 high speed data circuit or 1 compressed video circuit, the cost would be \$15,000 to \$25,000 for both ends. A radio system that provides 1 full motion video circuit can be installed for \$40,000 to \$60,000. Maintenance expense would be extra.

6.0 SYSTEM ADMINISTRATION

In the process of collecting and summarizing data that went into this report, one aspect of state telecommunications became very clear. There is an urgent need to establish centralized management of the state's telecommunications services.

Over the last 10 years there have been at least three events that have revolutionized the telecommunications industry and placed a tremendous burden on those who order products and services from the industry. First, telecommunications markets have become more competitive during the late 1970's and early 1980's as a result of federal regulatory and court decisions that first allowed and then promoted competition. Secondly, in 1984 an agreement between the United States Justice Department and AT&T resulted in AT&T's divestiture of the 22 local Bell Operating Companies (BOC's). Until that time, AT&T provided local telephone service to 80% of the population in the United States and long distance service to approximately 95% of the population. The divestiture separated the BOC's into seven companies independent of each other and independent of AT&T. Now the BOC's provide local telephone service and long distance service within specified regional areas while AT&T provides long distance communications primarily on an interstate basis as well as manufacturing communications equipment.

Thirdly, advances in technology have made available a variety of new products and services that were not cost effective or did not exist a decade ago.

In the "good old days" the local telephone company was the single point of contact for all telecommunications services. Rates were not negotiable; there were few, if any, options and no alternative suppliers. Administering telecommunications services was not overly complex. Today, telephone sets, key systems and private branch exchanges are available from literally hundreds of suppliers. Long distance services (with varying capabilities and price structures) are available from at least a dozen companies. New and improved technologies have made such services as paging, cellular radio, satellite, voice mail and electronic mail widely available. Telephone jargon, which has never been easy to understand, has been filled with new terms such as LAN, WAN, ISDN, videotex, gbs, AOS, COCOT and STS. *

Add to this the ongoing regulatory changes at both the state and federal levels make effective management of a telecommunications system today a much more demanding task than ever before.

Presently, telecommunications services within our state government are administered primarily by three organizations: The Department of General Services, the State Communications Board and the University of Nevada System. General Services works within the executive branch of government and typically oversees ordering service from local and long distance telephone companies and allocates billing for telephone services among the agencies. Individual agencies are free to design and install separate telephone systems as required to meet their specific needs. The State Communications Board is charged with administering the state owned microwave network. This network was originally built to serve state public safety requirements. Today, in addition to serving public safety requirements, a substantial portion of current capacity is now leased to General Services and the University System to meet their communications requirements. The University of Nevada System administers their own voice and data requirements.

* LAN - Local Area Network
WAN - Wide Area Network
ISDN - Integrated Services
Digital Network
gbs - gigabits per second

AOS - Alternative Operator Services
COCOT - Customer Owned Coin Operated
Telephone
STS - Shared Tenant Services

In 1987, the Council of State Policy and Planning Agencies prepared a report titled "State Telecommunications Management." In the report, several problem areas were identified in states that did not have centralized administration of state telecommunications services:

- * Lack of procurement procedures suitable for a newly competitive, chaotic and rapidly evolving marketplace.
- * Little coordination among state voice, data and video telecommunications services.
- * Little coordination within and among different branches of state government.
- * Little coordination with other information technologies like data processing and office automation.
- * No source within state government to get information on new technologies or how these technologies may be applied to improve productivity or enhance service offerings.
- * Failure to consider new and existing telecommunications capabilities in state strategic planning

States are not alone when it comes to dealing with problems created by the rapidly evolving telecommunications industry. A survey of 12 large corporations conducted by Touche-Ross, a management consulting firm, revealed corporations reorganizing along the following lines:

- * All corporations have a centralized decision making process for both voice and data.
- * The centralized telecommunications group is responsible for both planning and operations.
- * The central body has final authority over decisions involving capital equipment acquisitions and networks.
- * The central telecommunications division does not "stand alone" but is a part of a larger organization in which data processing, management information services and data collection all report to the same executive.

Reorganization has paid off for these companies. The private sector companies who have reorganized their telecommunications function report that total telecommunication costs were reduced by 20%.

Benefits realized by states and businesses who have implemented improved telecommunications management procedures generally fall into three areas:

1) Containing or reducing telecommunications costs by improving procurement planning and decision making. Cost savings of at least 20% have been achieved by businesses and states that have done so.

2) Improving state program efficiency through better use of telecommunication-based information technology. One conservative study indicates typical program costs savings of 8 to 10 per cent.

3) Using telecommunications to conduct state activities or deliver public services in new ways. Although estimates of potential cost savings in this area is not available, the experience of businesses indicates such savings are greater than the 8-10% range cited above for improved efficiency.

It is clear that Nevada can also reap the benefits of a centralized telecommunications management organization. The organizational structure required to implement necessary policies and procedures can range from a strengthened telecommunication group within General Services to a departmental level organization responsible for all state communications. As a minimum, the Department of General Services should hire additional personnel with the appropriate background and experience to perform the following functions for the executive branch of government:

- * Assist agencies with evaluation of telecommunications requirements.
- * Provide direction and guidelines in areas involving system budgeting, procurement and management.
- * Disseminate information on new technologies and applications, legislation and regulatory issues.
- * Allocate common costs to user agencies.
- * Monitor and control telecommunications costs.
- * Coordinate special studies (such as ACR68).
- * Monitor and control implementation of ACR68 recommendations.

It is critically important that, regardless of the degree to which telecommunications services are centralized or in what organization that function resides, controls must be established to insure the telecommunications group is responsive to the needs of user agencies. New telecommunications capabilities are increasingly more than just "administrative grease" for marginally improving state agency efficiency. Today these capabilities provide completely new ways of accomplishing old tasks. Telecommunications has reached a level of strategic importance within state government that centralized management and administration of this resource is imperative.

7.0 CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS:

1. City, county and state government agencies are not realizing the cost reductions, time savings and enhanced service offerings available through current communications technology.
2. Although no input was solicited from the general public, comments were received expressing interest in the capability of a state network to receive public, cultural and community events.
3. There is a need for primary and secondary school teachers to take university courses leading to a masters degree from the rural communities where they work. This can be done via an interactive telecommunications network.
4. There is a need to provide law enforcement, medical, legal and other professional training to individuals in rural areas of the state. This can be done via an interactive telecommunications network.
5. Since many of the industries that the Department of Economic Development is trying to bring to rural Nevada are interested in educational opportunities, an interactive video network will enhance these recruiting efforts.
6. Within state government, critical decision-making regarding equipment, planning, training and information access is highly decentralized and uneven in the level of expertise.
7. The state microwave system does not now have the transmission capacity to satisfy city, county and state telecommunication needs.
8. Any network deployed by the state should, to the maximum degree practical, incorporate the capability of Instructional Television Fixed Service (ITFS) systems in Reno and Las Vegas.
9. Since many significant assumptions were required in developing system costs in Section 4, no conclusions should be drawn regarding the cost effectiveness of a leased versus owned network.
10. It is likely that a combination of leased (utility provided) and state owned networking will provide the best combination of services and prices to the state while giving the shortest time to put a system in service as well as completing a statewide network.
11. The majority of states that have already implemented telecommunications networks have experienced savings while services were being expanded.

12. Several years ago employers identified a need to improve the computer literacy of their employees. Today, there is a need to improve the "communications literacy" of the general employee population.

RECOMMENDATIONS

The comprehensive user telecommunications survey results suggest the following recommendations for consideration by the 1989 session of the State Legislature:

1. Establish a State Telecommunication Advisory Board which would be broadly representative of the telecommunication user community and would have authority to review and recommend future telecommunication activities statewide.
2. A pilot project should be funded that will test the acceptance of an enhanced voice, data and video telecommunications network by city, county, state government, school districts and the University System. As a minimum, the pilot should include Reno/Carson City, Las Vegas and two rural communities.
3. Regardless of the action taken on ACR 68, the legislature should provide for the necessary personnel and organizational structure to manage, plan and coordinate the state's telecommunications resources. Inherent in the recommendation is that the organization be vested with the necessary responsibility and authority to be effective.
4. State personnel should establish telecommunications training for public employees.
5. Establish a statewide directory of facsimile locations and code numbers.
6. Work closely with the University of Nevada System to see where the experience and specialized knowledge they have gained in developing their present networks can be applied to the State's needs.

8.0 TELECOMMUNICATIONS SURVEY REPORT

SECTION 1

COMPILATION OF STATEWIDE TELECOMMUNICATION USER NEEDS

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DATA CIRCUITS

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
DMV and Public Safety					
Have	12	3	All codes.	Vehicle registrations and titles, driver's licenses, car dealers and salesmen, law enforcement wants or warrants.	Real time exchange of data and information among the locations of facilities throughout the state.
Need	-	-	-	-	-
City of Henderson					
Have	1	2	Henderson-All, All-Henderson, Henderson-All, All-Henderson	Police use for statewide telecommunications network to replace existing microwave system. Statewide system for information during legislative session.	Cost savings.
Need	-	-	-	-	-
SIIS					
Have	5	-	Carson City, Carson City	Users in Carson City SIIS offices access/update claims/policy/premium/financial databases at central state computer.	Improved service to claimants and employers.
	1	-	Carson City, Reno	Users in Reno SIIS offices access/update claims/policy/premium databases at central state computer.	Improved services to claimants and employers.
	2	-	Carson City, Las Vegas	Users in Las Vegas SIIS offices access/update claims/policy/premium databases at central state computer.	Improved service to claimants and employers.
50	3	-	Carson City, Carson City	Support data processing activities in Carson City.	More productive program development and report distribution.

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
SIIS					
Need	-	-	-	-	-
Department of Prisons					
Have	-	-	-	-	-
Need	20	1	Stewart - Carlin, Carson City, Ely, Indian Springs, Las Vegas, Lovelock, Pioche, Reno, Stewart, Tonopah, Wells, Winnemucca, Yerington, and Jean and Rtns.	Administrative offices can send and receive bookkeeping data; supply and food orders; personnel and inmate records and various others.	Reduce mailing costs and streamline bookkeeping systems. Records could be kept on disks to reduce paper volumes.
Lincoln County School District					
Have	-	-	-	-	-
Need	6	2	Panaca-Carson City, Carson City-All, Panaca-Pioche, Caliente, Alamo	Information transfer between schools and/or State - Delivery and sending.	Shorten delays, reduce travel and avoid expenses..

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Nevada Employment Security Department					
Have	23	-	Carson City— Las Vegas, No. L.V., Henderson, Reno, Incline Village, Sparks, Fallon, Carson City, Win- nemucca, Elko, Ely.	Used to access UI, employment and employer data from local offices statewide. Lines are also used for RJE applications to printers within the statewide network.	Allows NESD employees to better service the public, and work at a higher rate of efficiency. The lines also allow large reports to be transmitted rather than mailed.
	4	-	Carson City-All	Used to access the above data from a portable terminal.	Allows NESD employees to function outside their normal work areas or in areas that do not have established local offices.
Need	-	-	-	-	-
Yerington High School					
Have	-	-	-	-	-
Need	7	1	Dayton, Fernley, Yerington, Silver Springs, Smith Valley.	Access to state, university, library data bases for research, bibliographic searching, etc.	Greater student access to information. Cost saving for libraries.
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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
University of Nevada System	Have	-	Statewide	Exchange of University data information between mainframe computers.	Save time through increased speed and port availabilities.
			Statewide	Data exchange between University communities, community colleges and their outlying service areas.	Increased speed and availability to central computing on the UNLV campus.
	Need	-	-	-	Statewide sharing of specialized resources. It would be especially useful for registration, advisement and record keeping.
City of Sparks	Have	-	Sparks - Sparks, Sparks - Carson City, Sparks, - Reno	Primary application is to allow access to City Computer resources. Also, have needs to access State Highway Computer and Washoe County Computer data bases.	Allows use of computer information and automated systems to enhance delivery of city services.
	Need	3	-	Individual device circuits that could be combined on a smaller number of high capacity channels.	
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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Clark County School District					
Have	Every School (128)	-	Two-way between schools and central office	Pupil Accounting, Payroll, test data, and other data sent from schools to central office. Electronic mail.	Reduction in mail service. Immediate accounting data back to schools. Elimination of turn around time.
Need	-	-	-	-	-
State Department of Data Processing					
Have	60 (Dedicated; up to 9600 Bps)	-	Carson City-Carson City, Carson City-Elko, Carson City-Ely, Carson City-Fallon, Carson City-Hawthorne, Carson City-Henderson, Carson City-Las Vegas, Carson City-No. L.V., Carson City-Reno, Carson City-Sparks, Carson City-Stewart, Carson City-Win-nemucca, Carson City-Yerington.	Statewide agency on-line transaction and inquiry processing.	Direct input; up-to-the minute data.

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
State Department of Data Processing	3 up to 56.2 KBps)	-	Carson City-Carson City, Carson City-Reno	PC local area network connections.	Bulk file data transmission in an acceptable time frame.
Need	2 (Dial) up to 19.2 KBps Digital Data Circuits	3	Carson City-Reno	Same as above.	Same as above.
	15 (Dedicated; up to 56.2 KBps)	1	Carson City-Carson City, Carson City-Reno, Carson City-Las Vegas	Same as above.	Same as above.
Legislative Council Bureau					
Have	11	-	Terminate in Carson City; originate within state.	Access to NELIS computer system.	Access to Bill Status, NRS, and other subscriber services.
	-	-	All-Carson City	Users throughout the state access a state library data base via a dial-up or dedicated data circuit. The data base contains a listing of various books and reference material and their availability.	Reduced research time and greater public access to information.

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Legislative Council Bureau					
Need	-	-	-	-	-
State Library					
Have	20	-	All	Users from throughout the state access the library data bases on each of our six computers throughout the state via a dial-pov dedicated data circuit. The database contains a listing of the books and reference materials held by all libraries in the state and their availability.	Reduced research time and greater public access to information. Statewide sharing of specialized resources such as found in State Library, UNR and UNLV. Interlibrary loan.
Need	-	-	-	-	-
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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Washoe County School District					
Have	-	-	-	-	-
Need	60	2	All	Users access a County and State Library database via a dedicated data circuit. The database contains a listing of various books and reference material and their availability.	Reduced research time and greater public access to information. Availability to check books out of any library "on line." Improved flexibility of our community-school library.
Welfare					
Have	3 - Switches (dial-up data)	-	Carson City - statewide	Electronic verification of Medicaid eligibility.	Cost reduction, improved service to Medicaid clients and providers.
	5 - Lines on Rotary	-	Carson City - statewide	Rework database access.	Dissemination of information, data collection for management information.
	16 - Dedicated 9600 Bps	-	Carson City - Reno	Medicaid Fiscal Agent.	Provision of health care to the needy.
	1 - Switched Data Line	-	Las Vegas (Cannon Ctr. to Controller in LV)	Welfare Field Office; food stamps, Medicaid, social services.	Cost reduction, improved services to clients, data collection for management information.
	2 Dedicated 9600 Band Multidrop	-	Carson City - Winnemucca	Welfare District Office; Medicaid, ADC, food stamps, Child Support Enforcement, social services	Cost reduction, improved services to clients, data collection for management information.
64	2 Dedicated 9600 Band Multidrop	-	Carson City - Yerington	Same as above.	Same as above.

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Welfare	2 Dedicated 9600 Band Multidrop	-	Carson City - Las Vegas	Same as above.	Same as above.
	7 Dedicated 9600 Band Multidrop	-	Carson City - Henderson	Same as above.	Same as above.
	2 Dedicated 9600 Band Multidrop	-	Carson City - Hawthorne	Same as above.	Same as above.
	2 Dedicated 9600 Band Multidrop	-	Carson City - Ely	Same as above.	Same as above.
	20 Dedicated 9600 Band Multidrop	-	Carson City - Las Vegas (DDP Facility to LV Food Stamps 610 Belrose)	Same as above.	Same as above.
	49 Dedicated 9600 Band Multidrop	-	Carson City - Las Vegas (DDP Facility to LV District Office 700 Belrose)		

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Welfare	5 Dedicated 9600 Band Multidrop	-	Carson City - Elko	Same as above	Same as above.
	2 Dedicated 9600 Band Multidrop	-	Carson City - Fallon	Same as above.	Same as above.
	24 Dedicated 9600 Band Multidrop	-	Carson City - Reno (DDP Facility to Reno Field Office)	Same as above.	Same as above.
	19 Dedicated 9600 Band Multidrop	-	Carson City - Carson City	Same as above.	Same as above.
	6 Dedicated 9600 Band Multidrop	-	Carson City - Carson City (DDP Facility to Carson City Field Office)	Same as above.	Same as above.
Need	-	-	-	-	-

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Secretary of State's Office					
Have	-	-	Carson/State-wide	To add/modify databases concerning corporations, ltd. partnerships and UCC filings through the state's mainframe.	Improved service to customers, cost savings, savings to staff time and increased productivity by staff.
Need	-	-	-	-	-
Supreme Court					
Have	4	1	Bidirectional between Carson City and Las Vegas	Allows transfer of data between offices via computer. Allows computer hardware/software vendors access to equipment for diagnostic purposes.	Enables the workload to be shared by employees at different offices, and allows for quicker response by vendors to equipment hardware or software problems.
Need	4	1	Bidirectional between Carson City and Las Vegas	Improvement of present system.	Faster data transfer would allow more time to be spent working on documents, and, and less time waiting for the documents to transfer.
Clark County School District					
Have	16 Dial-Up	-	Central office to all Clark County school sites.	Information exchange, distribution, and processing; also class work in data processing for high schools.	Timeliness of information.
	9 Dedicated	-	Central office to all Clark County school sites.	Information exchange, distribution, and processing; also class work in data processing for high schools.	Timeliness of information.
Need	16 Dial-Up	1	Central office to all Clark County school sites.	Information exchange, distribution, and processing; also class work in data processing for high schools.	Timeliness of information.
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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Clark County School District	20 - Dedicated	-	Central Office to all Clark County School Sites.	Information exchange, distribution, and processing; also class work in data processing for high schools.	Timeliness of information.
Taxation					
Have	3	-	Reno, Carson City, Las Vegas	Approximately 32,000 accounts are on this system and all 3 offices have access to it for informational, processing and compliance functions. The system is on the State's main-frame.	Information exchange among the Department's three offices for our own information and taxpayer assistance as well.
Have	-	-	-	-	-
Nevada Employment Security					
Have	6 - Microwave (State)	-	Carson - Las Vegas, No. Las Vegas, Henderson, Reno, Incline Village, Sparks, Fallon, Elko, Winnemucca, Ely	Used to access UI, ES, and employee data from local offices statewide. Lines are also used for RJE applications to network printers. Electronic mail is also used over these circuits.	Allows NESD employees to service the public, and work at a higher rate of efficiency. The lines also allow large reports to be transmitted rather than mailed.
	16 Local Telco	-	Same as above	Same as above.	Same as above.
	5 AT&T Long Line	-	Same as above.	Same as above.	Same as above.

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Nevada Employment Security	7 Local Numbers	-	Carson City - all	Used to access above data from portable terminals.	Allows NESD employees to function outside their normal work areas or in areas without established offices.
	1 - 800 Service	-	Same as above.	Same as above.	Same as above.
Need	-	-	-	-	-
KNPB Public Television					
Have	-	-	-	-	-
Need	Need to tie in at each head end.	3	Reno/Carson City	Communications between public television and Washoe County County and Carson City School District. Sharing an access of public and educational programming available to K through 12 teachers.	Immediate access to on-air schedule of instructional programming and access to several data bases within public broadcasting listing thousands of educational resource materials available to teachers.
Controller's Office					
Have	1 Leased Phone	-	Carson City/ Carson City	Transmission of accounting data to IBM System.	Speed
	4 Dial Phones	-	Carson City - Reno, Carson City, Sparks, Las Vegas	Transmission on on-line accounting information to state agencies.	Timely information, reduce paper work, reduce voice calls into controller's office.
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Need	-	-	-	-	-

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Agency for Nuclear Projects					
Have	4	-	Carson City/all	Send and receive PC data.	Quicker data exchange.
Need	-	-	-	-	-
Gaming Control Board					
Have	3	-	Las Vegas, Reno, Carson City	Auditing, tax collecting, law enforcement, investigative, and administrative functions.	Reduced costs; better information; more current information; more input from available resources.
Need	1	1	Elko	Law enforcement.	Better information; more current information.
	1	2	Laughlin	Law enforcement	Better information; more current information.
Southern Nevada Children's Home					
Have	-	-	-	-	-
Need	1	1	-	Personal computer setup and modem. Dedicated line. Transmit data.	Gives us access to the State computer.
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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Administration/Rehabilitation Division					
Have	2 Digital lines with LAN's	-	Carson City-Reno	-	-
Need	2 Digital or better (fiber optic) lines	-	Carson City to Las Vegas	-	Decrease information processing time and increase amount of information processed.
Health Division/Vital Statistics					
Have	1	-	Carson/Carson	Data entry/retrieval, data processing/mainframe	Quick retrieval of statistical data.
Need	-	-	-	-	-
Health Division/Office of Health Officer					
Have	1 Data entry to FMIRs	-	Carson/Carson	Date entry to Controller's Office.	Allows for adjustments to the Management Information System without going through Controller's Office.
Need	-	-	-	-	-

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Health Division/ WIC					
Have	6 to Data Processing	-	Las Vegas/ Reno; Carson City/Carson City	Data entry to data entry mainframe	Allows for direct entry of voucher and client information cutting turn around time.
Need	-	-	-	-	-
State Fire Marshal Division					
Have	Burroughs B25	-	-	In-house, confidential files and computation.	Multi-station, with modem it could be connected.
Need	50	1	All fire department administration.	Receive and return fire statistics to all communities who report; to report and receive national fire data. Statistics include: hazardous materials incidents; fire department and civilian injuries and death; fire causes; rescue calls; arson and investigative information; insurance reporting information; and other budgetary information as needed.	Improved management of fire operations and use of funds in meeting mandates and programs through the use of confirmed data. Analysis of actual state and local fire problems. Will allow compilation of hazardous materials information and incidents will pinpoint arson or insurance problems in the state. Will standardize prevention inspection reporting in the state. Will allow for objective expenditure of funds.
Department of Commerce/ Manufactured Housing					
Have	2 on line CRT data entry	-	Carson City	Processing and record keeping of the division's mobile home titling and licensing functions.	Elimination of paper files and allows various analysis of information on file.
Need 80	-	-	-	-	-

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Department of Transportation					
Have	4 Dedicated	-	Reno, Carson/ Las Vegas, Carson	Dedicated data for data entry; engineering and planning problems.	Real time data exchange; one circuit (LV) via microwave; one circuit via Nevada Bell.
	10 Dial-up	-	Carson City - Las Vegas, Ely, Elko, Tonopah, Winnemucca	Dial-up data entry for management information, payroll, accounting.	Dial-up over microwave system, public telephone network, for economy.
	18 Cable Pairs	-	DOT Carson City to computer facility Carson City.	All accounting, payroll, engineering, and data gathering storage.	Fixed, inexpensive link to the State computer facility.
Need	-	-	-	-	-
Department of Wildlife					
Have	4 4-wr data	-	Reno, Carson, Fallon, Elko, Las Vegas	Boat registration.	Accuracy, cost savings.
	1 4-wr data	-	Reno/Carson	NCJIS	Officer safety.
Need	-	-	-	-	-

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Department of Personnel	Have				
	1 - Microwave line; 9600 Baud	-	Las Vegas/ Carson City	Applicant tracking system - The system consists of a Prime 2655 computer with 315 MB - 4 MB memory, streaming tape drive, 8 channel multiplexer, dedicated lines to and from state microwave line, 2 modems and regular phone lines, 4 printers and 25 terminals.	Allows for one database statewide; reduces duplication.
	2 - Standard phones; 2400 Baud Modems	-	Statewide - Carson City	-	-
	31 - TRAC System	-	-	-	-
	16 - 3274 IBM Control Unit	-	Carson City/ Carson City	On-line inquiry of personnel/payroll system files; our current personnel/payroll system is a batch system. We are review for the possibility of going on-line for the processing of payroll. The listed data circuits are the circuits required to go on-line.	-
Need	4 Dedicated 9600 Baud	-	Carson City/ Carson City, 3 lines	Accessing the mainframe for employee and position information. PC's will double as terminals into the TRAC System as well as serving normal PC functions. (database, spreadsheet, etc.). These will replace dumb terminals.	Each section within the division will be able to access employee and information necessary to do his/her job without having to call the records section or the budget division.
	16 Ports	-	-	Applicant tracking system. This will allow more users.	Current many employees have to share terminals; this would allow most users to have his/her own.
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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Department of Personnel	1 Micro-wave line	-	-	Same as above.	Same as above.
	20 - Dedicated 9600 Baud	1	Carson City to Carson City	On-line personnel/payroll system.	Improve the processing of State's personnel/ payroll needs.
	8 - Multi point Long Haul 9600 Baud	-	Las Vegas/Las Vegas (single Line) Las Vegas/ Carson City	Same as above.	Same as above.
	9 - Dial (14 agencies) 2400 Baud	1	Las Vegas/Las Vegas (single line) Las Vegas/ Carson City	-	-
	1 - Dial 2400 Baud	1	Boulder City/Las Vegas	On-line personnel/payroll system	-
	1 - Dial 2400 Baud	1	Caliente/Carson City	Same as above.	-
	1 - Dedicated	1	Elko/Carson City	Same as above.	-
	20 - Dial 2400 Baud with Protocol Converter	1	Carson City/ Reno to Carson City	Same as above.	-

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Division of Emergency Management					
Have	8	1	Carson City/ Reno/Winnemucca/Elko/ Ely/Las Vegas	Emergency information dissemination.	Life and property.
Need	22	1	All	Emergency information, collection and dissemination.	Provide coordination and emergency response more efficiently.
Nevada Department of Education					
Have	1	-	Carson City	Micro to mainframe connection. Financial management download of FMIRS data to department network.	Better, more accurate up to date information. Time savings.
	2	-	Carson City, Las Vegas	Used for teacher certification records.	-
Need	19	3	Statewide	System for collecting data from all school districts linked to the Carson City and Las Vegas Offices.	More efficient data collection and storage.

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**ELECTRONIC MAIL
BULLETIN BOARDS**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Department of Prisons					
Have	-	-	-	-	-
Need	20	2	Stewart - Carlin, Carson City, Ely, Indian Springs, Las Vegas, Lovelock, Pioche, Reno, Stewart, Tonopah, Wells, Winnemucca, Yerington, Jean and Rtns.	Administrative offices can send and receive daily mail, information, data and reports. The other prisons and camps could send and receive the same between them,	Reduce mailing costs. Reduce response time to critical reports and issues. Provide an updated system to distribute mail and reports.
Lincoln County School District					
Have	1	-	Panaca-All	Electronic mail and bulletin board.	Linked to all districts and State Department of Education.
Need	6	4	All	Message service, helps assure the "free public meeting".	Time, information update, reminder of meeting times and places.
University of Nevada System					
Have	10	-	-	-	-
Need	50	-	All	Electronic messaging to the communities of the state in support of admissions, general public information, support of classroom instruction provided by other services as mentioned above.	Allow for non-timely information to be dispatched both to and from the University in support of instruction, research, admissions, etc.
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**ELECTRONIC MAIL
BULLETIN BOARDS**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
City of Sparks					
Have	144	3	Sparks - Sparks	Hewlett-Packard "HPDESKManager" software is utilized to provide mail, word processing, calendaring and filing capabilities.	More efficient communications between City Employees. Reduction of paperwork.
Need	50 more	3	Sparks - Sparks	It would be desirable to integrate this with other electronic mail systems (Washoe County for example).	-
State Department of Data Processing					
Have	?	-	All	Electronic messaging, calendaring and scheduling. (This function is provided over existing Data Circuits)	-
Need	-	-	-	-	-
Legislative Council Bureau					
Have	-	-	-	-	-
Need	1 - 5	2	Statewide	Would allow legislators to message reach other and LCB staff. Would eliminate "telephone tag".	-

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**ELECTRONIC MAIL
BULLETIN BOARDS**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
State Library					
Have	All	-	All	Used to send messages to all libraries and for interlibrary loan requests.	Saves time and money over mail delivery.
Need	-	-	-	-	-
Secretary of State's Office					
Have	-	-	-	-	-
Need	8	1	Anywhere in the country to Carson.	To allow clients to browse through our corporate filing/ltd. partnership and UCC databases w/out having staff help them...these clients would then be able to request copies of documents.	Staff savings in time; customer convenience; extra revenue generated for office.
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**ELECTRONIC MAIL
BULLETIN BOARDS**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Agriculture					
Have	2 EPA	-	Nationwide	Pesticide information.	Update on current information and actions taken by Federal agencies.
	1 APHIS	-	Nationwide	Pest problems - control of animal diseases.	-
	1 EPI-CON conf.	-	Nationwide	Animal disease control.	-
Need	-	-	-	-	-
Nye County School District					
Have	1	-	All school districts.	Special Net; message service, reports.	Information, meeting dates, etc.
Need	-	-	-	-	-
Gaming Control Board					
Have	120	-	Las Vegas, Reno, Carson City	Auditing; enforcement; investigative, administrative functions.	More current information; better use of existing resources.
Need	30	2	Las Vegas, Reno, Carson City, Elko, Laughlin	Auditing, enforcement, investigative functions.	More current information; more output from available resources.

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**TELECOMMUNICATIONS SURVEY
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**ELECTRONIC MAIL
BULLETIN BOARDS**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Humboldt County School District					
Have	1	-	All districts.	Send and receive messages.	-
Need	-	-	-	-	-
State Fire Marshal Division					
Have	-	-	-	-	-
Need	1	2	Carson City to DMV.	Vehicle registration and titles, driver's licenses, law enforcement wants or warrants.	Access to data and information from locations and facilities throughout the state. Access to data and information for inspection and incident handling.
	1	1	Carson SFM to Carson NHP	Registration of hazardous materials, transportation storage; types of materials, directions and incident control. Same form of connection to NHP (DMV).	Access to data and information for inspection and individual handling.
Department of Commerce/Manufactured Housing					
Have	3	-	Carson City and Las Vegas.	Interoffice communications between the Carson City and Las Vegas division offices.	Information transmission and inquiry between the two offices and from each of the two offices to the information contained on the state computer.
Need	-	-	-	-	-

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**ELECTRONIC MAIL
BULLETIN BOARDS**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Have	-	-	-	-	-
Department of Transportation	Need	7	2	Ely, Las Vegas, Tonopah. Real time distribution of memoranda, directives,	management information. Better information distribution, savings in mail
cost and time, more effective management.			Carson City to Reno, Winnemucca, Elko,		
Have	-	-	-	-	-
Department of	Personnel		terminals	1	
	Need	All on-line		Statewide	This would be added to the on-line Personnel/ Payroll System.
Quickly release changes in personnel/					
Have	-	-	-	-	-
payroll rules and procedures	when required.	Division of	Emergency Management	Need	3
				Dial-up	All
					For use by Emergency Management directors and public safety officials to obtain information on meetings, training seminars, and general information.
					Cost savings due to mailings and time of clerical staff to process—allow feedback or confirmation for meetings.
	100				

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**ELECTRONIC MAIL
BULLETIN BOARDS**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS	
Nevada Department of Education	Have	3	-	All Districts, Nationwide	SPECIALNET - Communicate with all school districts in the state and all state departments of education nationwide. Bulletin Board used to post meeting dates and used during the legislative session, to post daily legislative updates.	Ability to communicate instantaneously, to send batch mail, to access a large volume of information. Cost savings.
		1	-	Nationwide	THE SOURCE - Used by Council of Chief State School Officers for mail and bulletin board information. Daily information on education issues nationwide.	Same as above.
		1	-	Statewide	NEVADA UNION CATALOG - Access to library card catalogs in the State Library, Public Libraries, Academic Libraries and some school libraries around the state.	Quick access to information on where books and other resource materials are available anywhere in the state.
		1	-	Nationwide	PSI-NET - Network of State Department of Education Science Coordinators. Information relating to science programs is shared.	Ability to get information relating to science programs and what is happening in science instruction.
	Need	-	-	-	-	-
	102					103

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
DMV and Public Safety					
Have	?	-	All	Transfer of documents between registration division and outlying county assessors. Transfer of documents between law enforcement agencies.	Timely production of documents. Reduce postage and increase service to public by delivering documents more quickly.
Need	-	-	-	-	-
SIIS					
Have	1	3	Carson City	Transmit investment information in written format.	Same day transmission of investment information, saving time on telephone.
	1	3	Las Vegas	Transmit documents between SIIS - Carson City and Las Vegas.	Same day transmittal of documents.
Need	-	-	-	-	-
Department of Prisons					
Have	20	4	Stewart - Carlin, Carson City, Ely, Indian Springs, Las Vegas, Lovelock, Pioche, Reno, Stewart, Tonopah, Wells, Winnemucca, Yerington, Jean and Rtns.	The administrative office could send and receive photos, warrants and other legal documents involved in management of a prison system.	Could aid in increased efficiency of prison operations.
Need	-	-	-	-	-

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Lincoln County School District					
Have	-	-	-	-	-
Need	6	3	Panaca-Carson City, Panaca-Pioche, Caliente, Alamo, Carson City-All	Sending and delivery between schools and state agencies.	Time, cost, easy to update project papers.
Nevada Employment Security Department					
Have	-	-	-	-	-
Need	1	2	All - All	Transmission of documents.	Would allow local offices to transmit documents that could not be accessed through the main-frame.
Yerington High School					
Have	-	-	-	-	-
Need	11	2	Dayton, Fernley, Yerington, Silver Springs, Smith Valley.	Transmission of documents, contracts, official letters, research articles, memos, etc.	Reduced cost and time. Improved review and response time.

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
University of Nevada, Las Vegas					
Have	-	-	-	-	-
Need	4	1	Las Vegas to All	Increase communications of printed material between University supported agencies and Nevada communities.	Increased support of instruction and administrative support of the University system.
City of Sparks					
Have	-	-	-	-	-
Need	1	3	Sparks - Carson City, Sparks - Reno	Would be used to expedite flow of documents between various government agencies.	Enhance paper flow.
Clark County School District					
Have	-	-	-	-	-
Need	128 - every school	-	School-to-Schools, Ed Center-to-Schools, Schools-to-Ed Center	Transmission of various types of materials to schools—between schools, and from schools to Education Center.	Rapid-communication. Reduction in intraschool mail service.

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Legislative Council Bureau					
Have	1	-	Carson City and Las Vegas plus usage with agencies and companies with equipment.	Easy transfer of documents.	
Need	1	3	All-All	Documents, reports and other printed material is sent to and from various locations in the state.	"Real Time" transmission of printed material. Improved review and response times.
University of Nevada System					
Have	16	-	All	Used to transfer class materials between remote sights during the conduct of the credit Project NETWORK handicapped education classes. Also used for other classes and for the transfer of administrative data throughout the state. Used in conjunction with fax machines located at all other University of Nevada institutions.	Provides benefit of real time review and transmission of instructional materials during distance education classes, greatly increasing the interactive nature of such classes. Saves on telephone and mail costs, while allowing for instant sharing of complex documents, graphics, and photographs over long distances.
Need	15	-	-	-	-

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Secretary of State's Office					
Have	2	-	Carson to Las Vegas and nationwide. Las Vegas to Carson and nationwide.	To send and receive documents in a "speedy" manner.	Time savings. Convenience for both staff/clients. Extra revenue generated for office.
Need	-	-	-	-	-
Attorney General's Office					
Have	2	-	Carson City to Las Vegas/ nationwide.	Transmit documents between Carson City and Las Vegas and between the AG and National Association of Attorneys General, other Attorneys General and Conference of Western Attorneys General.	Immediate transmission of documents; documents transmitted from Carson to Las Vegas for filing in the courts and from Las Vegas to Carson City for same purpose.
Need	2 (Xerox 7021)	1	Carson City to Las Vegas/ nationwide.	Same as above.	Same as above. However, 7021 uses cut sheet paper capable of transmitting letter quality documents to ruled and numbered legal paper; has automatic document feed; is compatible with all Group II telecopiers; transmits legal or letter size documents; is capable of sending to multiple locations; i.e., all Attorneys General.

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Supreme Court					
Have	2	-	Carson City to Las Vegas; Las Vegas to Carson City	Transfer hard copy documents between offices.	Allows for immediate response to matters filed with different offices.
Need	-	-	-	-	-
State Treasurer					
Have	-	-	-	-	-
Need	1	On order.	Carson City - all.	Sending and receiving working documents to and from investment brokers and banks.	Provides current investment information and saves telephone time and mail delays.
Taxation					
Have	1 - Carson City 1 - Las Vegas	-	Las Vegas, Carson City	Rapid transmission of documents and other information.	Convenience, rapid transmission of important information.
Need	-	-	-	-	-
Agriculture					
Have	1	2-	Nationwide	Receive and send written information and laws.	Instant updating of information.
Need	-	-	-	-	-

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Employment Security					
Have	-	-	-	-	-
Need	1	2	All-All	Transmission of paper documents.	Would allow local offices to transmit and receive paper documents that could not be accessed through the mainframe network.
NV Commission on Postsecondary Education (CPE)					
Have	-	-	-	-	-
Need	2	1	Carson City, Las Vegas	Transfer documents, licenses, Sheriff's work permits, teachers' certificates, etc. between CPE offices or CPE Carson City office and CPE Chairman.	Timely production of documents. Effective updating of licenses and other documents.
Agency for Nuclear Projects					
Have	1	-	Carson City/All	Send and receive documents.	Quicker document exchange.
Need	-	-	-	-	-
116					117

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Gaming Control Board					
Have	2	-	Las Vegas/ Carson City	Transmittal of legal documents and externally generated correspondence.	Time savings; increased accuracy
Need	3	1	Elko, Laughlin, Reno	Enforcement activities.	Time savings; increased accuracy.
Southern Nevada Children's Home					
Have	-	-	-	-	-
Need	2	1	Boulder City/ Carson City	Transfer documents; billing operations.	Saves time and reduced postage.
Health Division/Radiological Health					
Have	1	-	Carson/Nye	Relay radiation issue's information.	Allows accurate and quick access to technical and enforcement documents.
Need	-	-	-	-	-
18					119

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Human Resources/ Director's Office					
Have	1	-	-	-	-
Need	-	-	-	-	-
State Fire Marshal Division					
Have	-	-	-	-	-
Need	1	3	Carson to National Net- work.	Exchange data information on legislation, fire problems, national trends, operational pro- grams and arson.	Cost savings, enhanced data and information. Improved service to clientele. Factual informa- tion to legislature and counsel.
Department of Transportation					
Have	7	-	Carson City to Winnemucca, Reno, Ely, Elko, Las Vegas, Tonopah	Send transportation permits, other department documents between headquarters, and district offices.	Immediate delivery of documents; postage savings by using department circuits on state microwave.
Need	-	-	-	-	-
120					121

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Mental Health/ Mental Retardation Division					
Have	-	-	-	-	-
Need	8	2	Carson City, Reno, Las Vegas	Transfer documents between Division of Mental Health and Mental Retardation agencies: fiscal, clinical, statistical and correspondence.	Same day transmission of documents. Saves retyping documents (clinical and correspondence) into existing word processing systems for transmittal.
Division of Emergency Management					
Have	-	-	-	-	-
Need	Dial up	3	All	Transmittal of correspondence in state and out.	Increase efficiency; avoidance of having to wait for need information.
KNPB Public Television					
Have	-	-	-	-	-
Need	15	2	Carson City, Elko, Ely, Fallon, Incline Village, Las Vegas, Lovelock, Reno, Tonopah, Winnemucca.	Distribution of programming information.	Reduction in copying and mailing expense.

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
State Library					
Have	-	-	-	-	-
Need	1	3	All	Delivery of information from one library to another around the state.	Improves access of users to information needed but located in libraries too remote from his location to receive in the time he needs it.
Washoe County School District					
Have	-	-	-	-	-
Need	60	1	All	Documents, reports, memos, and other printed material is sent to and from the district offices, other schools and governmental agencies. Transmission of school records between schools and to other school districts.	Improved transportation time along with improved review and response time. Information received will be timely and more cost effective.
	124				125

**TELECOMMUNICATIONS SURVEY
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**INTERACTIVE INSTRUCTIONAL
TELEVISION**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Lincoln County School District					
Have	1	-	Texas-Panaca	Covers work in advanced math, science and foreign languages. Available via satellite with telephone hook-up to classroom. Inservice training available for staff.	Courses available to students that are not usually available in rural districts.
Need	6	1	All	Instruction from school to school, inservice from state agency, emergency training and university classes.	Stronger programs by better training. Inservice can be given at any hour by transmitted video.
Yerington High School					
Have	-	-	-	-	-
Need	10-11	1	Dayton, Fernley, Yerington, Silver Springs, Smith Valley.	Two-way video, audio, media transmission to several classes in different schools.	Greater educational opportunities for small school/rural students. Opportunity for specialized classes not currently available. Reduced cost by sharing among several small schools.
University of Nevada System					
Have	-	-	-	-	-
Need	50	-	Las Vegas-Carson City, Reno	Interactive Instructional Television between UNS institutions. Can be the same as video teleconferencing.	There are many instances where a particular site does not have a sufficient number of students to support a course, or does not have an available instructor. The system could provide classes for these areas.
	126				127

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INTERACTIVE INSTRUCTIONAL
TELEVISION

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
State Library					
Have	-	-	-	-	-
Need	?	2	All	Continuing education for librarians could be provided more often for less money and time.	Quality of service improves as library staffs are better trained.
Gaming Control Board					
Have	-	-	-	-	-
Need	5	2	Las Vegas, Reno, Carson City, Elko, Laughlin	Training agents.	Travel cost savings; broader application and quick dissemination of information.
	128				129

INTERACTIVE INSTRUCTIONAL
TELEVISION

AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Washoe County School District					
Have	-	-	-	-	-
Need	60	1	All	Two-way video is used for curriculum meetings, administrative personnel conferences as well as direct communication with a variety of agencies and departments.	Deliver out-of-town academic events to reduce travel needs and costs. The school and community specialized professional training is more readily available. Advanced degree courses can be provided without travel to a District or university location. Training costs are greatly reduced.
	25	2	All	Instant contact.	Cut cost in getting contact with school district officials.
KNPB Public Television					
Have	-	-	-	Complete broadcast production and post-production facility for instructional programming.	-
Need	Depending upon the number of schools on system.	1	Origination-Reno; termination varies.	Interactive and instructional television delivery to a variety of school district, community college and university sites.	By providing the capability to feed the interactive instructional television system, the state can take advantage of nearly \$1,000,000 of existing high-quality production equipment.
130					131

**TELECOMMUNICATIONS SURVEY
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**INTERACTIVE INSTRUCTIONAL
TELEVISION**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Department of Personnel					
Have	-	-	-	-	-
Need	-	4	-	We are considering this but it would be at least five years before we need this telecommunication.	-
Division of Emergency Management					
Have	-	-	-	-	-
Need	17	3	All	Implement required training courses to state and local emergency responders.	Avoid travel, per diem, and time required to travel throughout Nevada to train state and local personnel on emergency management programs.
	132				133

**TELECOMMUNICATIONS SURVEY
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SECURE VOICE

Page 43

AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
DMV and Public Safety					
Have	-	-	-	-	-
Need	?	1	All	Highway Patrol, Division of Investigations.	Provide for secure means of relaying confidential information to field personnel.
University of Nevada System					
Have	-	-	-	-	-
Need	2	-	All	Training and instruction to all communities of the state for University course support and support of Continuing Education. Use for confidential transactions.	Increased capacity to teach in communities which are not now reached for instruction
City of Sparks					
Have	-	-	-	-	-
Need	80	1	Sparks - Sparks, Sparks - Reno	Would be used to provide secure communications in law enforcement, i.e., Undercover Operations	Allow for communications that could not be monitored by criminals. Telephone is currently used for situations requiring security.

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**TELECOMMUNICATIONS SURVEY
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SECURE VOICE

Page 44

AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Agriculture					
Have	1	-	Statewide	Report livestock thefts and illegal butchering activities.	One statewide number acts as a theft deterrent.
Need	-	-	-	-	-
Gaming Control Board					
Have	-	-	-	-	-
Need	6	1	Las Vegas, Reno, Carson City, Elko, Laughlin	Law enforcement activities.	Help assure success of undercover operations; improve agent safety.
Division of Emergency Management					
Have	1 STU II Voice Subscription System	-	Carson	Used by DEM with Federal agencies when discussing classified or sensitive information.	Full security.
Need	-	-	-	-	-
Department of Wildlife					
Have	4	1	Reno, Fallon, Elko, Las Vegas	Law enforcement communications, undercover, covert, sensitive, etc.	Secure information.
Need	136	-	-	-	137

**TELECOMMUNICATIONS SURVEY
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**STATE WIDE INSTRUCTIONAL
TELEVISION (FULL VIDEO)**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Clark County School District					
Have	Las Vegas - All	-	ITV Network Center in Las Vegas (KLVX) providing a scheduled ITV schedule to all schools.	The existing ITV service in KLVX (Dept. of TV Services) would provide a multiple channel ITV operation which would provide 16mm via television and pre-produced programs.	Cost saving by providing a statewide service. Statewide evaluation and selection committee for programming. Scheduling committee (statewide) for developing annual ITV schedule.
	TV Service to each school and return feed. Las Vegas - All	-	Interschool Communication System	Primarily for outlying schools such as Moapa Valley High, Virgin Valley High, and Indian Springs High School.	Allows the teaching of courses not available at the high schools mentioned because of limited enrollment. Provides a central ITV network center in Las Vegas feeding schools.
Need	-	-	-	-	-
Agriculture					
Have	-	-	-	-	-
Need	1	3	Statewide	Continuing and specialized education.	Cost effective training not now available.
Have	-	-	-	-	-
Need	1	-	Statewide	The production and distribution of instructional programming.	Reaches all areas of the state.

**TELECOMMUNICATIONS SURVEY
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**STATE WIDE INSTRUCTIONAL
TELEVISION (FULL VIDEO)**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
KNPB Public Television					
Have	-	-	-	Existing equipment for production and post-production of instructional television.-	-
Need	-	1	Origination-Reno/Termination-Las Vegas	To distribute throughout northern Nevada high-quality preproduced instructional television. The ability to interconnect with the Clark County School District/KLUX for the production and distribution of statewide instructional television.	If coordinated statewide, cost savings could be achieved by coordinating statewide buys for programs. If the system is complete, it would allow the distribution of rural communities as well.
DHR/YSD/ Bureau of Services for Child Care					
Have	-	-	-	-	-
Need	-	-	Wendover, Wells, Eiko, Winnemucca, Battle Mountain, Ely, Fallon, Yerington, Fernley, Mesquite, Pahrump, Tonopah, Round Mountain, Hawthorne	To train children providers and parents in areas dealing with children: child development; abuse/neglect, curriculum, safety, health.	Community awareness in issues dealing with child care.

**TELECOMMUNICATIONS SURVEY
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**STATE WIDE
PAGING**

Page 47

AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Lincoln County School District					
Have	-	-	-	-	-
Need	10	5	All	Paging service, special needs while in an outlying area.	Important information, time, money, timely messages reduce both cost and travel.
Nevada Employment Security Department					
Have	-	-	-	-	-
Need	1	1	All - All	Employees could be contacted anywhere in the state.	Improved emergency response time.
City of Sparks					
Have	-	-	-	-	-
Need	25	3	Sparks - All	Would be used for city employees traveling in the state.	Allow for contact with employees in an emergency situation.
Legislative Council Bureau					
Have	-	-	-	-	-
Need	1	3	All-All	Individuals carrying a commercially available paging unit can be accessed in any community in the State.	Improved emergency responses. Shortened time frame for decision making.

**TELECOMMUNICATIONS SURVEY
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**STATE WIDE
PAGING**

Page 48

AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Secretary of State's Office					
Have	-	-	-	-	-
Need	9	2	Carson/State-wide	Contact key staff personnel when they are out of the office.	Convenience for both customers and staff members. Cost savings in personnel time, and elimination of "telephone tag."
Office of Attorney General/Investigation Division					
Have	-	-	-	-	-
Need	1	2	Las Vegas/Las Vegas	Paging service; individuals carrying pager can be accessed in the metropolitan area of Clark County.	Important information, time, money, timely messages reduce both cost and travel. Improved emergency response time.
Agriculture					
Have	-	-	-	-	-
Need	4	3	Statewide	Emergency contacts when in field.	Ability to contact key personnel in case of emergency.
Employment Security					
Have	-	-	-	-	-
Need	1	1	All-All	To contact employees anywhere in the state.	Improved emergency response time.

**TELECOMMUNICATIONS SURVEY
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**STATE WIDE
PAGING**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Welfare Division					
Have	-	-	Las Vegas-Las Vegas area	Remote Paging (Beeper Service)	Improved service to clients, cost reduction.
Need	-	-	-	-	-
Department of Transportation					
Have	-	-	-	-	-
Need	?	3	Carson City/Statewide	To reach administrative personnel and other key individuals when they are away from their offices.	More rapid response to problems, more efficient manpower.
Division of Emergency Management					
Have	5	1	Carson City/Reno/Winnemucca/Elko, Las Vegas	Used to connect DEM staff for administrative and emergency requirements.	Immediate response by DEM duty officers - increase productivity.
Need	-	2	All	Same as above.	Same as above.

**TELECOMMUNICATIONS SURVEY
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**TWO WAY RADIO--
DATA**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
University of Nevada System					
Have	-	-	-		
Need	2	-	All	A variety of data to be collected from the various communities in the State of Nevada.	Support of instruction and research, by allowing real time acquisition of seismic and other data available in the communities of the State of Nevada
City of Sparks					
Have	-	-	-		
Need	25	1	Sparks - Sparks, Sparks - Reno	Would be used to provide mobile data terminal capability for Police and Fire vehicles.	Allow for onsite data communications i.e., Vehicle license lookup for Police, dispatching information for Police & Fire, communication of structural and hazardous material information,
Parole and Probation					
Have	3	-	Carson City	Transmit data between Las Vegas and Carson City Office; transmit and receive data between Clark County District Attorney's and our Las Vegas Office, and teletype to transmit and receive scope information.	Allows for hard copy transmittal of reports, PSI's for revision when time not available for mail delivery; time efficient for offices of P & P as well as DA's office in preparation of PSI reports.; time efficient in investigations and supervisory of offenders of law enforcement information.
	2	-	Las Vegas	Same as above.	Same as above.
Need	-	-	-		

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**TWO WAY RADIO--
DATA**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Department of Transportation					
Have	-	-	-	-	-
Need	Mobile to computer	3	Statewide	Allow the immediate exchange of data between field operations and the data processing center.	Great savings and time and travel.
Department of Wildlife					
Have	-	-	-	-	-
Need	40+	3	Statewide	Law enforcement, research data, E-mail.	-
Division of Emergency Management					
Have	2	-	Carson City/Winnemucca	Presently testing mobile data system.	Accurate information to field units; more efficient use of radio spectrum.
Need	Statewide	2	All	Same as above.	Same as above.

**TELECOMMUNICATIONS SURVEY
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**TWO WAY RADIO--
VOICE**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
DMV and Public Safety					
Have	?	-	All	Highway Patrol, Investigations	Provides for distribution of information and instructions to field personnel.
Need	-	-	-	-	-
City of Henderson					
Have	-	-	-	-	-
Need	1	2	Henderson-All, All-Henderson	Statewide radio system for police, fire and others.	Inter-communications during emergencies.
Department of Prisons					
Have	-	-	-	-	-
Need	20 Stations and up to 100 mobile units	8	All - All	The radio system would operate between all prisons, camps, mobile units and select personnel.	Each prison and camp would have a backup system to communicate with each other and mobile units.
City of Sparks					
Have	100	-	Sparks - Sparks, Sparks - Reno	Used to communicate with mobile units (or employees). Police, Fire, Court (Marshalls), Public Works, Leisure Services (Park Rangers) all use radios to assist them in performing their work.	Allows voice communication for mobile units and employees - Critical for Public Safety Services.
Need	-	-	-	-	-

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**TWO WAY RADIO--
VOICE**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Office of Attorney General/ Investigation Division					
Have	4	-	All	Statewide radio system.	Provides for dissemination of information to investigators; intercommunications during emergencies.
Need	2	2	All	Upgrade two radios.	Upgrade is necessary to be able to have voice communication statewide.
Clerk County School District					
Have	1000 plus land/ mobile	-	All sites.	Buses, security, maintenance, warehousing, and other services	Total communications w/all field services.
	Local Area Paging, 1 channel	-	Central Office to Urban Las Vegas	Out of office contacts with personnel.	Provides immediate contact with personnel in the field.
Need	-	-	-	-	-
Agriculture					
Have	7	-	Statewide	Law enforcement and officer safety.	Safety of personnel, rapid response to emergency situations.
Need	-	-	-	-	-

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**TWO WAY RADIO--
VOICE**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Gaming Control Board					
Have	93	-	Las Vegas, Reno, Elko, Laughlin	Law enforcement activities.	Reduced cost; more current information; more output from available resources; employee safety.
Need	20	1	Las Vegas, Reno, Elko, Laughlin; Carson City	Law enforcement activities.	Reduced cost; more current information; more output from available resources; employee safety.
Parole and Probation					
Have	51	-	Las Vegas, Reno, Carson City, Elko, Henderson, Winnemucca, Ely, Tonopah, Fallon	Communication with various police agencies.	Safety of staff, protection of community.
Need	-	-	-	-	-
Department of Transportation					
Have	38 (two-way radio net)	1	Statewide (Reno, Elko, Ely, Winnemucca, Las Vegas, Tonopah, to 38 mountain top sites.)	Provide for day-to-day operation of DOT maintenance and construction projects.	Immediate contact with all department staff.
Need	-	-	-	-	157

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VOICE**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Department of Wildlife					
Have	Statewide Radio System (18 mtns/ 5 offices)	-	Reno, Fallon, Elko, Ely and Las Vegas	Provides statewide radio coverage for employees of Department Wildlife while engaged in official Forestry Conservation Radio Service duties as allowed by FCC Rules and Regulations.	Efficiency, personnel safety.
Need	-	-	-	-	-
Division of Emergency Management					
Have	-	-	Carson City, Reno, Winnemucca, Elko	Administrative and emergency communication with staff personnel.	Public Health and safety; better coordination.
Need	Statewide	1	All	Same as above.	Same as above.
KNBP Public Television					
Have	-	-	-	-	-
Need	15	1	Carson City, Elko, Ely, Fallon, Incline Village, Las Vegas, Lovelock, Reno, Tonopah, Winnemucca.	Communications with agencies at community sites.	Safety.

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**VIDEO
TELECONFERENCING**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
DMV and Public Safety					
Have	-	-	-	-	-
Need	?	2	All	Training sessions, conferences.	Timely training, interaction by parties to answer questions, define issues and provide clear directions to participants. Reduce need for travel.
City of Henderson					
Have	-	-	-	-	-
Need	1	2	Henderson-All	Use of video conference to replace in-person meetings especially with persons/officials from opposite ends of the state.	Save time and travel money.
Yerington High School					
Have	-	-	-	-	-
Need	11	1	Dayton, Fernley, Yerington, Silver Springs, Smith Valley.	Interdistrict - student, faculty, administration - classes, meetings, conferences, etc. Expedite flow of information.	Reduce number of physical meetings. Allows greater access to diversity of information for students. Reduce travel for all involved.

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**VIDEO
TELECONFERENCING**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
University of Nevada System					
Have	-	-	-	-	-
Need	10	-	All	Video Teleconferencing between universities.	Reduced travel costs because video teleconferencing can be used in lieu of personal meetings.
				Video teleconferencing meetings in lieu of travel.	Reduced amount of travel to Nevada communities. Increased capacity for instruction via video teleconferencing.
City of Sparks					
Have	1	-	Sparks-Reno	Video arraignments of suspects.	Judge can perform an arraignment without having the suspect from the jail facility - saves on transportation costs.
Need	5	3	Sparks - All, Sparks - Reno	Would be utilized for certain intergovernmental meetings and/or presentation.	Save travel expenses. Greater usage of time.
Legislative Council Bureau					
Have	-	-	-	-	-
Need	1 - 5	1	Statewide	Permit citizens to testify at public hearings without having to travel to Carson City.	-
	1	2	Carson City-All	Using video telephones allows law enforcement officials to verify the whereabouts of offenders on parole or probation without physically meeting with the individual. Officials can also get a hard copy print of the video at any point in the conversation.	Reduces the number of physical meetings required. Frees law enforcement officials for other duties. Provides a hard copy record of documents at the offenders premise (e.g., driver's license, pay check stubs, etc.). Allows more intense supervision of offenders.

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TELECONFERENCING**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Supreme Court					
Have	-	-	-	-	-
Need	1	3	Bidirectional between Carson City, Las Vegas, Elko and Tonopah.	For various meetings of judges and court clerks scheduled throughout the year.	Decrease in travel time and expenses.
Taxation					
Have	-	-	Anywhere	Interviews, meetings, etc.	Cost savings, time saver, expediting procedures when people aren't available for a face to face meeting.
Need	-	-	-	-	-

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
KNPB Public Television					
Have	-	-	-	Complete production facilities for organization of video teleconferencing.	-
Need	Variable	1	Origination/Reno	Need capability to access statewide video teleconferencing distributive system.	Again, by providing the capability for KNPB to feed into the system, the state can take advantage of nearly \$1,000,000 of state of the art production and postproduction video equipment.
Gaming Control Board					
Have	-	-	-	-	-
Need	2	1	Las Vegas/ Carson City	Hearings; board & commission meetings; training sessions.	Travel cost savings; improved access to information.
Southern Nevada Children's Home					
Have	-	-	-	-	-
Need	2	2	Boulder City/ Carson City	Aids in conducting conferences, meetings and training.	Conduct meetings without traveling.

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Department of Transportation					
Have	-	-	-	-	-
Need	7	2	Carson City to Reno, Elko, Ely, Winnemucca, Las Vegas, Tonopah	Staff meetings; preconstruction conferences; public hearings.	More participation in meetings; reduction of travel; better public access.
Department of Personnel					
Have	-	-	-	-	-
Need	1	2	Reno/Las Vegas/Elko to Carson City	The Personnel Commission meets four times a year. Several state agencies attend this meeting. These agencies are located throughout the state.	This would reduce the travel time required to attend the meeting by agencies that would normally attend the meeting in addition, the cost of travel would be reduced.
Division of Emergency Management					
Have	-	-	-	-	-
Need	-	-	All	Discuss agency matters with state and local Emergency Management Directors and other public safety officials.	Decrease costs and time of travel and man hours.

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
State Library					
Have	-	-	-	-	-
Need	6	2	All	Use in lieu of meetings to coordinate library activities.	Improves quality of conferencing.
Washoe County School District					
Have	-	-	-	-	-
Need	60	3	All	Two-way video is used for curriculum meetings, administrative personnel conferences as well as direct communications with a variety of agencies and departments.	Precludes the need for travel from our remote locations to centralized governmental agencies. Timely communication and information services are now available. Instructional leadership time is enhanced by reduced travel time. Improved participation in curriculum and policy meetings. Increased awareness of district and other governmental procedures.

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**VIDEO
TRAINING**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Yerlington High School					
Have	-	-	-		
Need	11	1	Dayton, Fernley, Yerington, Silver Springs, Smith Valley.	Voice, video, transmission from one source to several locations. Lectures and demonstrations to students, faculty, board members, adult groups.	Reduced travel time and cost. Consistency of information delivery. Greater educational opportunity.
University of Nevada, Las Vegas					
Have	-	-	-		
Need	3	2	Las Vegas-Carson City, Reno	Training and instruction to all communities of the state for University course support, and support of Continuing Education.	Increased capacity to teach in communities which are not now reached for instruction.
	2	2	Las Vegas - All other communities	Training and instruction to all communities of the state for University course support, and to support Continuing Education courses.	Increased capacity to teach in remote communities which are not now reached.
University of Nevada System					
Have	-	-	-		
Need	10	-	All	To link all campuses to ITFS	

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**VIDEO
TRAINING**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
University of Nevada-Reno, IMS					
Have	Unlimited number of connections within service area, based on number of antenna purchased.	-	Originates in Reno; reception throughout Reno, Carson City, and Minden. Termination at special location switch the appropriate antenna (estimate 20), as well as at homes with cable TV (55% of all homes in each region). Short-term expansion desired to Incline Village, South Lake Tahoe, Fallon, and Susanville.	This is an Instructional Television Fixed Service (ITFS) system used to transmit live instructional and training courses from Reno to homes and institutions throughout the major population areas of western Nevada. Description of "Video Training" is not entirely accurate, in that voice teleconferencing is used to provide live two-way interaction with each receive site.	Chief benefit is ability to transmit pre-existing live classes to students away from campus. This capability greatly reduces the cost of providing distance education courses by using existing instructors and course materials. Students benefit from having access to both top quality instructors and a larger pool of their peers from throughout the state, and from a great reduction in travel time and expense required to complete a degree.
Need	At least ten connections.	1	Origination in Reno and Las Vegas. Termination in Fallon, Winnemucca, Lovelock, Battle Mountain, Austin, Incline Village, Glendale, Lake Tahoe, Elko, Ely, Pioche, Tonopah, Hawthorne, Las Vegas, Susanville, and Yerington.	This application could involve a combination of ITFS, coaxial cable, or fiber optic. Preferred mode is full-motion standard video channel, with digitized compressed video as a less desirable alternative.	This would allow for extension of live instructional programming directly into rural communities, greatly expanding the base of credit instructional courses that can be offered state-wide. University enrollments would increase, while more rural residents would be able to enroll. Would also greatly reduce the cost of offering remote courses, training, and meetings.

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TRAINING**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
State Library					
Have	-	-	-	-	-
Need	?	1	All	Continuing education for librarians could be provided more often for less money and time. Programming could be shared with users statewide.	Quality of service improves as library staffs are better trained.
Gaming Control Board					
Have	-	-	-	-	-
Need	5	-	Las Vegas, Reno, Carson City, Elko, Laughlin	Agent and staff training.	Standardization of training; reduced travel, better utilization of existing resources.
Parole and Probation					
Have	8	-	In-house only in all four districts: Elko, Carson City, Reno, Las Vegas. Central office has undercover production capability.	Used for staff training to produce consistency of training throughout state.	Consistency of training; reduce liability problems; protection of staff.
Need	-	-	-	-	-

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
DHR/YSD/ Bureau of Services for Child Care					
Have	-	-	-	-	-
Need	-	-	Wendover, Wells, Elko, Winnemucca, Battle Mountain, Fallon, Ely, Yerington, Femley, Mes- quite, Pahrump, Tonopah, Round Mountain, Hawthorne	To train children providers and parents in areas dealing with children: Child Development, abuse/neglect, curriculum, safety, health.	Community awareness in issues dealing with child care.
Department of Transportation					
Have	-	-	-	-	-
Need	7	2	Carson City to Winnemucca, Reno, Elko, Ely, Las Vegas, Tonopah	Provide training to maintenance, engineering personnel, office staff, construction crews and just about all department personnel located away from headquarters.	Make more training opportunities available to more personnel; save travel expense associated with training.

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**VIDEO
TRAINING**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Department of Personnel					
Have	-	-	-	-	-
Need	1	3	Carson City to Ely/Elko/Reno/ Las Vegas/ Fallon/Sparks/ Winnemucca/ Henderson	This department provides statewide training for State of Nevada employees. Video training would allow the same training to all employees. Our department is in the process of securing some video equipment.	Reduce the travel time and cost of required for mandatory training. If an employee did not understand a part of the training presentation, the tape could be rerun for clarify.

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**VOICE
MAIL**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
University of Nevada System					
Have	-	-	-	-	-
Need	6	-	All	To supplement the voice service and to allow for automatic answering of telephones and providing of voice messages to all communities in the State of Nevada.	Improved service from what we have at the present. Will allow for classroom support of instruction and cleaner interfaces between professors and their students and staff.
City of Sparks					
Have	-	-	-	-	-
Need	200	2	Sparks - All	Would be used in conjunction with Electronic Mail to provide mail capability to those without access to a data terminal. Ideally this would be integrated with an electronic mail system.	More efficient communications between City Employees as well as City employees and the Public. Reduction of paperwork.
Department of Transportation					
Have	-	-	-	-	-
Need	7	3	Carson City to Reno, Elko, Ely, Winnemucca, Las Vegas, Tonopah	To provide a voice message capability which will allow messages to be stored and retrieved when correspondents are not at their telephones.	Reduce what is commonly called "telephone tag". Would help expedite the interchange messages, thus providing better communication among staff members.

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**VOICE
SERVICE**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
SIIS					
Have	379	-	Reno, Elko, Las Vegas, Carson City	Telephone Line	-
Need	-	-	-	-	-
Department of Prisons					
Have	-	-	-	-	-
Need	20	3	Stewart - Carlin, Carson City, Ely, Indian Springs, Las Vegas, Lovelock, Pioche, Reno, Stewart, Tonopah, Wells, Winnemucca, Yerington, Jean and Rtns.	Administrative offices can send and receive voice service to all Prisons and Camps. The other prisons and camps could send and receive the same between them.	Reduce existing phone service costs.

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**VOICE
SERVICE**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
City of Sparks					
Have	-	-	Sparks - All	Used to provide voice communication capability for City Employees.	Allows city employees a means of communicating with other employees, other agencies and the public.
Need	-	-	-	-	-
Legislative Council Bureau					
Have	40	-	Local - some long distance	LCB staff and legislators	Normal telephone
	2	-	Intrastate	Legislators - Access to each other, LCB, constituents	State telephone inter connect.
Need	-	-	-	-	-
Secretary of State's Office					
Have	30+	-	Carson to Statewide Las Vegas to Statewide	Audio communication between offices staff and customers.	Ease of communications, time savings, cost savings.
Need	-	-	-	-	-
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SERVICE**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Supreme Court					
Have	70	-	All area codes.	Judges, staff, and public contact. Normal telephone.	-
Need	-	-	-	-	-
Gaming Control Board					
Have	196 - Las Vegas 125 - Carson City 67 - Reno 5 - Elko	-	-	Telephone service	-
Need	30	2	Las Vegas	Telephone Service	-
	15	2	Carson City	Telephone service	-
	10	2	Reno	Telephone Service	-
	5	2	Laughlin	Telephone service	-
State Library					
Have	-	-	-	-	-
Need	1	3	All	-	-
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**VOICE
SERVICE**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Department of Transportation					
Have	100+ Switch	-	Las Vegas	Department owned telephone switch providing all office phones; with direct lines to Carson City and other department offices, providing toll-free, interoffice calling.	Telephone access to all employees, public access, low cost calling among department staff.
	40+ Switch	1	Elko	Same as above.	Same as above.
	30+ Switch	1	Winnemucca	Same as above.	Same as above.
	30+ Switch	-	Ely	Same as above.	Same as above.
	50+ Key System	-	Reno	Provide public access; intercommunication capability.	Same as above.
	20+ Key System	-	Tonopah	Same as above.	Same as above.
Need	-	-	-	-	-
University of Nevada System					
Have	-	-	-	-	-
Need	35	-	Reno, Carson City, Elko, Fallon, Gardnerville, Las Vegas, Stewart, Reno, Henderson, No. Las Vegas.	Inter-university voice communications throughout all of UNS. Backbone system of 24 channels interconnects between the UNLV and UNR telephone switches.	UNS Systemwide voice access for all internal University/System functions.

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**VOICE
TELECONFERENCING**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
DMV and Public Safety					
Have	-	-	-	-	-
Need	?	3	All	Beneficial for training sessions and staff conferences statewide.	Reduce travel and provide for interaction by staff.
	20	5	Stewart - Carlin, Carson City, Ely, Indian Springs, Las Vegas, Lovelock, Pioche, Reno, Stewart, Tonopah, Wells, Winnemucca, Yerington, Jean and Rtns.	Administrative offices could hold staff and management meetings.	Reduce number of management and staff meetings, but need video technician in each location.
University of Nevada, Las Vegas					
Have	-	-	-	-	-
Need	3	1	Las Vegas-Carson City, Reno	Voice teleconferencing between universities.	Reduced travel costs because voice teleconferencing can be used in lieu of personal meetings.
	2	2	Las Vegas - All other communities	Voice teleconferencing meetings in lieu of travel.	Reduced amount of travel to Nevada communities. Increased capacity for instruction via audio teleconferencing.
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TELECONFERENCING**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Lander County School District					
Have	-	-	-	-	-
Need	10	1	Austin/Battle Mountain	Voice conference between Austin/Battle Mountain - Commissioner duties - Road & Bridge services - Sheriff use of secure voice. County government can use all types of service.	Instant communications eliminate travel for meetings.
City of Sparks					
Have	200	-	Sparks - All	Used on occasion to allow more than two to communicate by voice.	Allows more than two people to converse and share information.
Need	-	-	-	-	-
Legislative Council Bureau					
Have	-	-	-	-	-
Need	5	2	Carson City-Elko, Ely, Winnemucca, Tonopah, Las Vegas, Reno, Washington, D.C.	Regularly scheduled voice conferences are used to discuss issues common to each of several districts offices. Voice conferences are also used to discuss project status among individuals located in Carson City, Washington, D.C. and a district office location.	All participants hear the same input from each other. Expenses associated with physical meetings are eliminated.
	194				195

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TELECONFERENCING**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
University of Nevada-Reno					
Have	Up to 12 locations; two groups of 6 possible at one time. Expansion of current bridge to 20 ports and addition of 20 port bridge in Las Vegas desired.	-	Any location with a telephone line. Conferencing bridge currently located in Reno; desired in Las Vegas.	Used to conduct credit and non-credit courses that are taught simultaneously in communities throughout the state; also used to bring in national and regional experts via phone, to conduct statewide meetings; job interviews, and training. Currently being used to reach 80 students for a statewide credit class on handicapped education.	Provides live interaction necessary for all modes of distance education. Significantly lowers cost of travel for training, education, and meetings. Lower cost than commercial services of same type.
Need	12x	-	-	-	-
Secretary of State's Office					
Have	3 installed with telephone system	-	Carson City/Las Vegas	For communication between the north and south offices w/out expending the money for travel.	Cost savings on travel; savings on staff's time.
Need	-	-	-	-	-
196					197

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**VOICE
TELECONFERENCING**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Supreme Court					
Have	-	-	-	-	-
Need	6	4	Between all points statewide.	Voice conferences could be beneficial from time to time, in lieu of scheduling meetings.	Elimination of lost time and travel expenses.
Gaming Control Board					
Have	393	-	All locations equipped with a telephone.	Used to discuss case status and administration matters common to multiple offices.	Travel cost savings; speeds exchanges of information.
Need	-	-	-	-	-
Department of Transportation					
Have	-	-	-	-	-
Need	7	3	Carson City to Reno, Elko, Ely, Winnemucca, Las Vegas, Tonopah	Conduct meetings among headquarters' staff and district engineers and construction personnel around the state.	More immediate control with staff, less time and money spent in travel.
Taxation					
Have	To the extent of the state switch-board	-	Anywhere.	Interviews, meetings, etc.	Cost savings, time saver, expediting procedure when people aren't available for a face-to-face meeting.
Need	-	-	-	-	-

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TELECONFERENCING**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Agriculture					
Have	Statewide telephone system all offices.	-	Statewide	Contact regional office simultaneously.	Departmental efficiency.
Need	-	-	-	-	-
State Library					
Have	-	-	-	-	-
Need	6	-	All	Use in lieu of meeting to coordinate library activities.	Saves travel time and expense.
Washoe County School District					
Have	-	-	-	-	-
Need	2	-	All	Regularly scheduled voice conferences are used to discuss issues common to district's remote locations and other governmental agencies.	Expenses and travel time associated with physical meetings are eliminated, all participants hear the same input from each other.

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**WIDE AREA
TELEMETRY**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Department of Prisons					
Have	-	-	-	-	-
Need	20	7	Stewart — Carlin, Carson City, Ely, Indian Springs, Las Vegas, Lovelock, Pioche, Reno, Stewart, Tonopah, Wells, Winnemucca, Yerington and Jean and Rtns.	Administrative offices would have another system to collect data than those listed above.	Would work as a back-up system to insure constant contact with the Prisons and Camps.
University of Nevada System					
Have	-	-	-	-	-
Need	2	-	All	This may be a reality in the above mentioned Two-Way Radio data area, if not, it can be repeated here as far as Telemetry.	-

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**WIDE AREA
TELEMETRY**

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Clark County School District					
Have	?	-	Central office to all school sites.	Provide remote surveillance of school district buildings and property.	Reduces number of personnel needed to patrol schools after hours. Provides rapid response to schools in emergency situations.
	?	-	Central office to all school sites. Provide automated remote control of air conditioning and power systems at schools.	Reduced cost of operation for HVAC and heating systems.	-
Need	-	-	-	-	-
Commerce/Insurance Division					
Have	-	-	Statewide.	Used for citizens to call Division.	
Need	-	-	-	-	-
Department of Transportation					
Have	30+	1	Carson City to all other communities in Nevada.	To count vehicles passing, hourly, by travel lanes, in variously located spots throughout the State. Data is gathered weekly by telephone polling of various counter locations.	Better traffic counting, more counting locations, less staff travel, resulting in more good information for less money.
Need	60+	1	Carson City to all locations in Nevada.	Same as above.	Same as above.

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OTHER

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
TAXATION					
Have	4 Micro-wave phone lines	-	Carson City, Reno, Las Vegas, Elko	Phone communication.	Cost savings - flat charge.
Need	-	-	-	-	-
Agriculture					
Have	-	-	-	-	-
Need	2 Computerized telephone information service	1	Statewide	To receive off-duty hour calls to provide a service to the public.	To disseminate information to the industry and general public.
	3 Cellular telephone units	3	Statewide	Contact emergency services from remote locations.	Employee safety.
Rehabilitation Division					
Have	-	-	-	-	-
Need	2 Data circuits	-	Carson City/Las Vegas	-	Improve information processing capacity.

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
Welfare Division					
Have	-	-	-	-	-
Need	12 Cellular telephone units	-	Statewide	Welfare investigations and social services.	Timely contact with field staff for efficient operations. Increased safety of field staff in stressful or hazardous conditions.
Department of Personnel	-				
Have	2 Off Premise Voice Service	-	Las Vegas/ Carson City	Long distance telephone line.	Reduce the annual cost of long distance to Las Vegas.
Need	-	-	-	-	-
Division of MHMR					
Have	-	-	-	-	-
Need	23 IBM remote control units and 23 IBM 4800 Bps SDCC modems	1	Rural counties, Las Vegas, Carson City, Reno	Transmission of MHMR data (MIS system)	Save manual handling of MHMR operations data: fiscal, clinical, and human resources. Allow on-line retrieval of data.

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
University of Nevada System					
Have	-	-	-	-	-
Need	30 E-Net Data	1	Reno to Carson City, Elko, Fallon, Gardnerville, Las Vegas, Stewart, Reno. Las Vegas to Henderson, No. Las Vegas.	Connection of backbone system within the UNS a whole to provide host to host connectivity for Ethernet Data at 56 KB rate of academic, administrative and research computers to link together.	High speed system-wide access between the UNS several academic, administrative and research computers to provide economy of scale usage, statewide support on an equal basis, better dissemination of data, and reduction of time and costs to deliver information.
	10 System-wide Packet Data Access	1	Reno to Carson City, Elko, Fallon, Gardnerville, Las Vegas, Stewart, Reno, Las Vegas to Henderson.	Connection of over 2,000 terminals, PC's, workstations and word processors for access to host computers, system mail, etc. statewide. This packet system operates at a 56 KB rate.	Provides the "people" access to the UNS computers statewide, to electronic mail, teaching resources, administrative information and research data.
State Library					
Have	-	-	-	-	-
Need	Statewide Radio/TV	2	All	We would use this to provide specialized services to handicapped or homebound users. We would provide Radio Reading Services for blind; closed caption services for deaf.	There are no services for the blind in this state to read local papers or provide for their special needs. We are apply for grants to assist in beginning these services.

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AGENCY	CONNECTIONS	PRIORITY	COMMUNITIES SERVED	APPLICATION	BENEFITS
University of Nevada, Las Vegas Have	-	-	-	-	-
Need	1 State-wide Radio/TV	3	Las Vegas - Reno	Interface both television and radio signals to be retransmitted by stations located in Reno and to those stations accessed to the translators associated with them.	Increased communication capability for instruction and public information to the public radio and television audiences of the State of Nevada.
KNPB Public Television Have	-	-	-	-	-
Need	15 State-wide Radio/TV	1	Carson City, Elko, Ely, Fallon, Incline Village, Las Vegas, Lovelock, Reno, Tonopah, Winnemucca	Distribute a full broadcast day schedule to rural communities including educational and instructional programming.	Significant cost savings for rural television stations. Better service and program schedules.
University of Nevada System Have	-	-	-	-	-
Need	20 Media Class-rooms	-	All	Allow instruction at remote sites.	Instructor can send visual materials over standard telephone lines instantaneously.

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□ P.1.

NOTE: The Nevada Association of Counties and the Nevada League of Cities distributed questionnaires to their respective members requesting information on the same categories but in a different format from that used in formatting this section of the report. The following is a summary of the information gathered from the cities and counties:

	Nevada Association of Counties		Nevada League of Cities		Total "Have"/"Use" and "Need"/ "Would Use"
	Have	Need	Use	Would Use	
Data Circuits	75%	25%	29%	43%	89%
Voice Service	58%	17%	29%	29%	68%
Facsimile Service	8%	42%	29%	43%	58%
Voice Teleconferencing	42%	42%	57%	29%	84%
Video Teleconferencing	17%	42%	14%	43%	58%
Video Training	17%	33%	43%	57%	68%
Two way Radio - voice	100%	0%	86%	14%	100%
Two way Radio - data	33%	33%	14%	29%	58%
Electronic Mail - Bulletin Board	8%	33%	0%	43%	42%
Secure Voice	25%	25%	0%	14%	37%
Statewide Radio Paging	8%	50%	0%	57%	58%
Interactive Instructional Television	8%	58%	0%	71%	68%
Statewide Radio/Television	8%	50%	14%	57%	63%
Wide area Telemetry	25%	17%	14%	43%	47%
Voice Mail	33%	8%	14%	29%	42%

ACR 9.0 ACKNOWLEDGEMENTS

The Department of General Services is indebted to the many organizations who have provided valuable input to this study. Without such unselfish contributions from those listed below, this report could not have been completed.

1. Central Telephone Company
2. Channel 5 (Reno)
3. Channel 10 (Las Vegas)
4. Moapa Valley Telephone Company
5. NEC - Nippon Electronics Company
6. Nevada Association of Counties
7. Nevada Association of School Boards
8. Nevada Bell
9. Nevada League of Cities
10. Nevada School Districts
 - Carson City
 - Churchill County
 - Clark County
 - Douglas County
 - Elko County
 - Esmeralda County
 - Eureka County
 - Humboldt County
 - Lander County
 - Lincoln County
 - Lyon County
 - Mineral County
 - Nye County
 - Pershing County
 - Storey County
 - Washoe County
 - White Pine County
11. Nevada State Agencies
12. Nevada Telephone Association
13. Rockwell International
14. University of Nevada System

A special thanks to Eugene Paslov and Frank South of the Department of Education, along with "User" committee members:

Fred Dugger

Hank Etchemendy, Nevada Association of School Boards

G.P. Etcheverry, Nevada League of Cities

Warren Fox, University of Nevada System

Robert Hadfield, Nevada Association of Counties

Deborah Hecht, Clark County Community College

John Hill, Channel 10, Las Vegas

Juanita Karr, Northern Nevada Community College

Jim Kiley, Pershing County School District

Joan Kerschner, Nevada State Library

Marvin Moss, Washoe County School District

Jim Pagliarini, Channel 5, Reno

Mike Stowers, University of Nevada, Las Vegas

Also special thanks to Chuck Slavin along with "Technical" committee members:

Dick Belaustegui, University of Nevada System

John MacDonald, Department of Transportation

Gene Oakley, Department of Motor Vehicles and Public Safety

Richard Sheldrew, Department of Emergency Management

10.0 APPENDICES

10.1 USER COMMITTEE REPORT

ACR 68 USER COMMITTEE REPORT

SECTION I

INTRODUCTION

ACR 68 was passed during the 1987 session of the Legislature. The Assembly Concurrent Resolution charged the director of the Department of General Services to work in cooperation with state agencies and local governmental subdivisions, public school districts, the University of Nevada System, public utilities and private organizations in an effort to conduct a study of telecommunications in the State of Nevada.

In the summer of 1987, the Director of General Services requested the State Superintendent of Public Instruction to establish a "telecommunications user group" and prepare a report of telecommunications user needs in partial response to the requirements of ACR 68.

In the fall of 1987, the State Superintendent of Public Instruction invited a broadly based representative group of public officials to participate in the telecommunications user needs survey:

Fred Dugger, Data Processing

Hank Etchemendy, Nevada Association of School Boards

G.P. Etcheverry, Nevada League of Cities

Warren Fox, University of Nevada, Reno

Robert Hadfield, Nevada Association of Counties

Deborah Hecht, Clark County Community College

John Hill, Channel 10, Las Vegas

Juanita Karr, Northern Nevada Community College

Jim Kiley, Pershing County School District

Joan Kerschner, Nevada State Library

Eugene T. Paslov, State Department of Education

Marvin Moss, Washoe County School District

Jim Pagliarini, Channel 5, Reno

Hale Bennett, Department of Data Processing

Frank South, State Department of Education

Mike Stowers, University of Nevada, Las Vegas

Chuck Slavin, PSC - Coordinated technical committee issues with
user committee members

Dan Tone, University of Nevada, Reno

The user group had its first meeting on July 29, 1987. Since that time the user committee has met on four separate occasions.

PROCEDURES

Mr. Chuck Slavin, a former member of the PSC staff was asked to assist Mr. Terry Sullivan, the Director of General Services, to develop a telecommunications survey instrument. The instrument design was to be sufficiently flexible as to allow the collection of both user data and technical and cost data concerning the development of a statewide telecommunications system.

Mr. Slavin presented a draft instrument to the user committee on Wednesday, July 29, 1987.

Mr. Frank South, a staff member of the State Department of Education, reviewed the original survey instrument and with the assistance of the user group members made slight modifications to help those responding to better understand its purpose and data requirements.

The completed survey instrument was mailed in December of 1987 to:

- All Nevada School Districts (17)
- The University of Nevada System Office (1)
- The University of Nevada Campuses (6)
- The Nevada Association of Counties (1)
- The Nevada League of Cities (1)
- All Major State Executive Agencies (41)

Instructions were transmitted with the survey instrument and a contact person identified within the State Department of Education to assist survey recipients in completing the instrument.

It should be noted at this point that the Legislative Counsel Bureau, Research Division, had conducted an earlier telecommunications survey at the request of Assemblyman Robert Craddock. This survey was completed by forty-one (41) state agencies and established the background and design for the current, more comprehensive review of the telecommunications user needs of this state.

Other efforts have also been taken in Nevada to improve telecommunications. The University of Nevada System established a task force on Educational Telecommunications several years ago. The UNS task force brought together a statewide group of representatives to discuss educational concerns, to analyze the needs of the system to provide distance learning to rural Nevada, and to provide continuing education in urban areas as well. UNS has developed some plans to improve distance learning in Nevada and has implemented elements of a telecommunications system among its various campuses.

In May of 1984, a Legislative Subcommittee produced a report on Public Broadcasting in Nevada with a number of recommendations dealing with telecommunications and educational communications. Unfortunately many of the recommendations were not implemented. The authors did find, however, "telecommunications may be an alternative to meet the future demands on higher education." In this latter regard UNS has been seriously examining telecommunications as a method to expand their instructional services while holding down costs.

The current effort to assess user needs for telecommunications required the Executive Directors of the Nevada Association of Counties and the Nevada League of Cities to coordinate the completion of the survey instrument among their membership. This procedure took the form of key individuals representing these organizations around the state being identified to fill out the survey instrument and return their findings to the Executive Directors of the statewide organizations. The major user needs of the counties and cities were identified in this procedure. The completed surveys were then forwarded to the Department of Education for compilation and analysis.

Finally, the Department of General Services worked with the public utilities, in both northern Nevada and southern Nevada, to conduct demonstrations of telecommunication technology. User group representatives were asked to attend these sessions in an effort to help them better understand some of the possibilities of the emerging telecommunication technology.

Many of the findings resulting from the survey instrument are reported just as they were originally stated. It was staff's view that leaving the statements in an unedited form helps the reader of this report appreciate the specific thoughts of the users and provides a realistic assessment, e.g., what telecommunications users feel they really need.

The survey was completed by 76% of those who received it. This rate of return assures a high rate of confidence in the survey findings. Section 2 of this report includes a list of several special telecommunications projects being conducted in this state.

The remaining portions of the report include major findings and recommendations.

FINDINGS

There are several major findings which result from a careful review of the survey instrument. These findings are not meant to be all inclusive but rather illustrative of the needs of the telecommunications user group community:

- (1) While there is already in place an extensive statewide data transmission network, users clearly are demanding improved technology which will allow more data to be transmitted and data to be exchanged faster.
- (2) Users throughout the state, in virtually all organizations, expressed a need for interactive video for conferencing, for instruction, and for training.

- (3) There appears to be a lack of effective coordination of telecommunications networking within agencies. Critical decision-making regarding equipment, training, and informative access is highly decentralized and uneven in the level of expertise available.
- (4) As users become more aware of the potential use of facsimile technology there is increased demand for this form of telecommunications.
- (5) There is a clearly "defined corridor" of telecommunications development along the major highways in Nevada, e.g., systems are growing along I-80; Highway 50 and Highway 95. Conversely, there is less telecommunications activity along the less traveled thoroughfares.

RECOMMENDATIONS

The comprehensive user telecommunications survey results suggest the following recommendations for consideration by the Department of General Services and the 1989 session of the State Legislature.

- (1) Establish a State Telecommunication Board which would be broadly representative of the telecommunications user community and would have authority to review and recommend future telecommunications activities statewide. The following representatives are suggested for inclusion on the new Board.
 - General Services
 - University of Nevada System
 - State Library
 - Public Broadcast
 - Department of Education
 - Executive Office
 - Counties
 - Cities
 - Public Safety
 - Courts
 - Industry
 - School Districts
 - Department of Transportation
 - University Campuses
- (2) Establish a statewide telephone subcommittee which would be broadly representative of public users and which would have responsibility for reviewing and recommending telephone requirements for public agencies as a subcommittee of the Telecommunications Board.

- (3) Each state, county and city agency should consider establishing a telecommunications information center where staff can gather telecommunications information and/or receive training as necessary.
- (4) Establish, in cooperation with a public utilities and private entities, at least two pilot interactive video systems that can be used for conferencing, instruction and training. One pilot program should address a rural area. The other should consider an interactive video network down the Reno/Carson/Douglas/Las Vegas corridor.

The pilot programs should be specifically designed to enhance distance education in the rural areas and to demonstrate and test specific technology and to encourage economic development and diversification in urban and suburban areas.

- (5) State, county, city and school personnel operations should begin to examine the telecommunications background and competencies of future employees at all levels for the express purpose of upgrading the telecommunications skill levels of agency personnel.
- (6) Request state personnel to establish telecommunications training for public employees. State personnel should also consider establishing a new telecommunications special category.
- (7) Request that General Services submit BDR's to the Legislative Commission asking for fiscal support for pilot projects, support for new telecommunications and telephone committees, and support to General Services for coordination activities.
- (8) Establish a statewide directory of facsimile locations and code numbers.

SECTION 2

SPECIAL TELECOMMUNICATION PROJECTS BEING CONDUCTED IN NEVADA

TELECOMMUNICATIONS

SATELLITE RECEPTION QUESTIONNAIRE

NAME Dr. Neldon C. Mathews

DISTRICT Lincoln County School District

TELEPHONE NUMBER (702) 728-4471

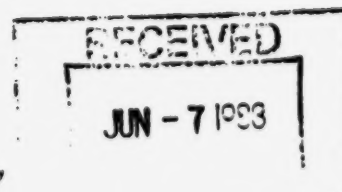
Please list the schools in your district that currently have satellite dishes on them. Indicate if the dish is C-Band (receive Public Broadcasting Channels) or Ku-Band; and whether or not the dish is fixed or "agile" (moveable to receive another signal).

SCHOOL	C-BAND	Ku-BAND	FIXED	AGILE
Lincoln County High School	X			X
C. O. Bastian	X			X
Pahrnagat Valley High School	X			X

**TELECOMMUNICATIONS
SPECIAL PROJECTS QUESTIONNAIRE**

PROJECT NAME Lincoln County TI-IN Project
FUNDING SOURCE General AMOUNT \$9,000
PROJECT COORDINATOR Dr. Neldon C. Mathews
AGENCY Lincoln County School District
BRIEF DESCRIPTION OF PROJECT:
(Who is served? How is it used? Information transmitted?)

The Lincoln County High School is participating in the TI-IN Project. This project is a direct satellite course to students and staff at Lincoln County High School utilizing television monitors and direct telephone communications. Courses provided by this system include: science, math, government, history, foreign language, psychology and sociology. Programs are provided for staff inservice. Lincoln County School District staff members participate in these and the inservice programs are taped for future reference.



JUN 13 1988

TELECOMMUNICATIONS
SPECIAL PROJECTS QUESTIONNAIRE

PROJECT NAME FIBER OPTIC CABLE INSTALL Phase 1 30K
FUNDING SOURCE GENERAL FUND AMOUNT \$60,000 ^{Total} " 2 30K
PROJECT COORDINATOR ED INGRAFFIA / RICK BAREUTHER
AGENCY CITY OF SPARKS

BRIEF DESCRIPTION OF PROJECT:
(Who is served? How is it used? Information transmitted?)

MAY, 1988 SPARKS CONTRACTED WITH WEDCO FOR PURCHASE OF FIBER OPTIC CABLE, MULTIPLEXORS, AND INSTALLATION SUPPORT TO LAY FIBER FROM CITY HALL TO THE POLICE BUILDING AND MUNICIPAL COURT BUILDING. CITY PUBLIC WORKS EMPLOYEES PULLED THE CABLE UNDER WEDCO'S SUPERVISION. PHASE 1 OF THE PROJECT COVERED CABLE INSTALL AND 32-PORT MUXS AT CITY HALL & COURT. THIS HAS BEEN COMPLETED AND SEVEN OF THE DATA LINKS ARE BEING USED TO CONNECT TERMINALS & PRINTERS AT THE COURT TO AN HP3000 COMPUTER AT CITY HALL. PHASE 2 WILL COVER EXTENSION OF THE CABLE TO OUR MAIN FIRE STATION, INSTALL OF 32-PORT MUXS AT CITY HALL AND POLICE AND INSTALL OF 32-PORT MUXS AT CITY HALL AND THE MAIN FIRE STATION.

TELECOMMUNICATIONS
SPECIAL PROJECTS QUESTIONNAIRE

PROJECT NAME SOS Subscription Service
FUNDING SOURCE Undetermined AMOUNT Undetermined
PROJECT COORDINATOR Lee-Ann Keever
AGENCY Secretary of State's Office
BRIEF DESCRIPTION OF PROJECT:
(Who is served? How is it used? Information transmitted?)

The Secretary of State's Office is in the process of computerizing its UCC Division. During the development of this project, the idea of a "subscription service" was conceived.

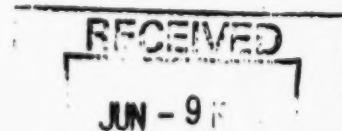
This subscription service would allow our customers to access our databases and/or leave orders for our staff. Our customers would use their own personal computers, modems and telephone lines for this. The accessing would be on "read-only" basis; customers would not be allowed to create, change or modify records contained in our databases.

Based upon similar services instituted in other states, we feel that this service would be convenient for our customers by providing the requested information in a "speedy" manner, while at the same time reducing the workload of an already over-worked staff.

A customer logging onto the system would be charged an access fee. It is hoped that the revenues generated by this project would "pay" for our data processing needs by making them self-supporting.

This agency is still in the process of trying to determine what equipment it will require to install, maintain and operate the subscription service, as well as how much the equipment will cost this agency. Until that determination had been made, we can not say with any certainty, which funding source will be used to fund this project.

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TELECOMMUNICATIONS
SPECIAL PROJECTS QUESTIONNAIRE

PROJECT NAME On-line Net Expansion
FUNDING SOURCE 90/91 Budget **AMOUNT** \$50,000
PROJECT COORDINATOR Barry Morgan
AGENCY State Controller

BRIEF DESCRIPTION OF PROJECT:

(Who is served? How is it used? Information transmitted?)

Additional equipment and software that will allow agencies that are on-line with Central Data Processing IBM network, to address data bases maintained on the Hewlett Packard computer in the Controller's Office.

Additional agencies, at little or no extra cost, will have more timely information. One area of importance in developing accounting and reporting capabilities is in the area of grants accounting. Eventually the dial-in network and the on-line IBM net will allow all agencies direct inquiry of accounting data.

TELECOMMUNICATIONS

SPECIAL PROJECTS QUESTIONNAIRE

PROJECT NAME: On-line Personnel/Payroll System

FUNDING SOURCE: Unknown at This Time AMOUNT: Unknown

PROJECT COORDINATOR: Karen Kavanau

AGENCY: Department of Personnel, State of Nevada

BRIEF DESCRIPTION OF PROJECT:

(Who is Served? How is it used? Information transmitted?)

Our Department is currently reviewing the need to upgrade the current batch personnel/payroll system to on-line system with entry capabilities. This would allow better response time to personnel/payroll problems and reduce the lag time due to mailing of documents. Agencies would enter time sheet information and limited changes on the employment document in order to update the computer system master files. This would increase the quality of payment to the employee since any problems would be corrected in the office where the employee works. You will note that most of our data circuits will be used for this project, if approved.

TELECOMMUNICATIONS
SPECIAL PROJECTS QUESTIONNAIRE

PROJECT NAME Project Network
U.S. Office of Education
FUNDING SOURCE Telecomm. Training Grant **AMOUNT** \$91,135.00
PROJECT COORDINATOR Penny Royce
AGENCY Dept. of Human Resources/University of Nevada-Reno
BRIEF DESCRIPTION OF PROJECT:
(Who is served? How is it used? Information transmitted?)

PROJECT NETWORK

Goal: To develop an innovative, cost-effective model which uses telecommunications technology to provide in-service and pre-service training to early childhood special education professionals living in rural Nevada.

Objective 1: To develop and disseminate a model using state-of-the-art telecommunications to deliver telecourses to rural Nevada.

Objective 2: To develop and field test at three rural sites a four-course cycle of telecourses which will meet the requirements for Nevada's Early Childhood Special Education Endorsement.

Objective 3: To replicate the training model, offering two telecourses per semester at three new rural training sites.

TELECOMMUNICATIONS
SPECIAL PROJECTS QUESTIONNAIRE

PROJECT NAME Western Regional Telecommunications Cooperative
FUNDING SOURCE unfunded **AMOUNT** -
PROJECT COORDINATOR Dr. Warren H. Fox
AGENCY University of Nevada System, Chancellor's Office
BRIEF DESCRIPTION OF PROJECT:
(Who is served? How is it used? Information transmitted?)

The Western Interstate Commission for Higher Education, WICHE, is working with western states to establish a regional telecommunications cooperative for higher education. The primary purpose of the cooperative will be to encourage western states, their higher education institutions, and others to share and cooperate in the use of telecommunications for educational purposes. Possible activities include sponsoring engineering feasibility studies for interstate connections, joint acquisition of hardware, software, and programming, information gathering and dissemination, training, and better interstate communication.

The Chancellor's Office and the UNS Task Force on Educational Telecommunications sponsored a statewide meeting in Reno in April 1988 to examine and discuss Nevada's participation in the proposed cooperative.

TELECOMMUNICATIONS
SPECIAL PROJECTS QUESTIONNAIRE

University of Nevada System (UNS)
PROJECT NAME Task Force on Educational Telecommunications
FUNDING SOURCE UNS Board of Regents **AMOUNT** \$5,000.00
PROJECT COORDINATOR Regent JoAnn Sheerin, Dr. Warren H. Fox
AGENCY University of Nevada System

BRIEF DESCRIPTION OF PROJECT:
(Who is served? How is it used? Information transmitted?)

In April 1985 the UNS Task Force on Educational Telecommunications was formed by the Board of Regents and charged with studying telestudies education at the postsecondary level in Nevada. The task force was expected to 1) recommend policy which guaranteed an integrated system for telestudies in the System, 2) recommend to the Board policies pertaining to minimum standards of instruction, funding formulas, and administrative policies and procedures, 3) recommend on financial considerations, quality assurances and administration applicable to all institutions, and 4) recommend ways of funding the cost of delivery and develop a reasonable and equitable method of covering those costs.

The task force is composed of representatives from all UNS campuses, the Nevada Department of Education, public broadcasting, and interested state agencies and Nevada businesses.

The task force has gathered data, conducted research, held workshops, developed quality guidelines for UNS telecourses, developed a system-wide telecommunications plan, and forwarded a budget request to the legislature.

TELECOMMUNICATIONS
SPECIAL PROJECTS QUESTIONNAIRE

"Promises to Keep" A statewide telecourse on the
PROJECT NAME U.S. and Nevada Constitutions
Valley Bank of Nevada, National Endowment for the Humanities,
FUNDING SOURCE Nev. Humanities Committee **AMOUNT** \$19,000.00
PROJECT COORDINATOR Dr. Warren H. Fox
University of Nevada System/
AGENCY UNS Task Force on Educational Telecommunications

BRIEF DESCRIPTION OF PROJECT:
(Who is served? How is it used? Information transmitted?)

The Office of Academic Affairs, within the University of Nevada System Chancellor's Office, applied for and received a grant to create and broadcast, for the first time, a statewide telecourse on the U.S. and Nevada Constitutions in celebration of the Bicentennial of the U.S. Constitution. The project consisted of the production of two specially funded segments of broadcast quality on the Nevada Constitution and on related governmental issues unique to Nevada that were incorporated with the Annenberg tapes on the U.S. Constitution. The fifteen video segments and a companion study guide developed for the course formed the core of a for-credit college course that was aired throughout the state over public television stations and the Nevada Rural Television network during the fall semester 1986.

The goals for this project were: 1) to raise the level of awareness of the bicentennial celebration of the U.S. Constitution by developing and broadcasting a course on the Nevada and U.S. Constitutions, and 2) to demonstrate a new educational technology, delivering instruction through a statewide telecourse with the ability to reach 90% of Nevada's population.

TELECOMMUNICATIONS
SPECIAL PROJECTS QUESTIONNAIRE

PROJECT NAME Integrated Services Digital Network (ISDN)
FUNDING SOURCE Nevada Bell **AMOUNT** unknown
PROJECT COORDINATOR Cathy Confer/Dick Belaustegui/Dale Schulke
AGENCY Nevada Bell/University of Nevada System Computing Services,
University of Nevada System Desert Research Institute
BRIEF DESCRIPTION OF PROJECT:
(Who is served? How is it used? Information transmitted?)

GOAL: To prove in and provide long term ISDN connectivity at 56KB between Truckee Meadows Community College (TMCC) and the University of Nevada System Computing Services (UNSCS) and between Desert Research Institute (DRI) Dandini Park and UNSCS.

OBJECTIVE 1: To utilize Nevada Bell's latest technology to provide 56KB service between units of the University of Nevada System using ISDN networking techniques.

OBJECTIVE 2: a) To connect LANS at TMCC to UNSCS/North.
b) To connect high speed printing at TMCC to UNSCS/North
c) To connect IBM System 38 at TMCC to UNR Business College
d) To connect DRI Dandini to UNSCS/North hub for 56KB access to DRI Stead and UNS/North LAN.

OBJECTIVE 3: To provide enhanced teaching access for students and faculty to and from UNR and TMCC for IBM System 38 access, to provide lower cost access for all faculty, students and administration statewide to and from TMCC's LAN, to provide enhanced administrative printing capability between UNSCS and TMCC and to provide DRI's researchers with faster, cheaper access to NSF Net super access, earth satellite information, BITNET and intra-University division communications.

OBJECTIVE 4: To upgrade existing data path services to ISDN.

TELECOMMUNICATIONS
SPECIAL PROJECTS QUESTIONNAIRE

PROJECT NAME NSF NET
FUNDING SOURCE NSF AMOUNT unknown
PROJECT COORDINATOR Dale Schulke/Don Zitter
AGENCY University of Nevada System Desert Research Institute (DRI)
and University of Nevada System Computing Services (UNSCS)
BRIEF DESCRIPTION OF PROJECT:
(Who is served? How is it used? Information transmitted?)

- GOAL: To provide out-of-state access to the nation-wide National Science Foundation Network to provide connectivity to Super Computers for research work.
- OBJECTIVE 1: To provide a regional connection out-of-state to access Super Computers for research use within the University of Nevada System.
- OBJECTIVE 2: To provide NSF connectivity to all divisions of the University of Nevada System within the state on an equal access/equal service basis, for use by faculty and researchers.

TELECOMMUNICATIONS
SPECIAL PROJECTS QUESTIONNAIRE

PROJECT NAME BIT NET
FUNDING SOURCE University of Nevada
System Computing Services **AMOUNT** \$16,516/yr
PROJECT COORDINATOR Paul Franklin, UNSCS
AGENCY University of Nevada System Computing Services
BRIEF DESCRIPTION OF PROJECT:
(Who is served? How is it used? Information transmitted?)

- GOAL:** To provide nation-wide and overseas access to colleges, universities and research institutes for the exchange of research data and project information for all university researchers, faculty, students and administrators.
- OBJECTIVE 1:** To provide a nation-wide electronic mail exchange system for all researchers, faculty and administrators to colleges, universities and research institutions, nation-wide and overseas.
- OBJECTIVE 2:** To provide BITNET connectivity and message service to all divisions of the University of Nevada System within the state on an equal access/equal service basis.
- OBJECTIVE 3:** To provide access to information and data bases among and between all of the above entities.

TELECOMMUNICATIONS
SPECIAL PROJECTS QUESTIONNAIRE

PROJECT NAME Pilot Fibre Optics Project
FUNDING SOURCE Nevada Bell Pilot Funds **AMOUNT** unknown
PROJECT COORDINATOR Dan Tone/Dick Belaustegui
AGENCY University of Nevada-Reno Telemedia Services and
University of Nevada System Computing Services
BRIEF DESCRIPTION OF PROJECT:
(Who is served? How is it used? Information transmitted?)

GOAL: To provide as a pilot project, optical fibre video connections between the University of Nevada Medical School and the Veterans Administration hospital in Reno, Nevada.

OBJECTIVE 1: To make more efficient use of faculty and students time in conducting "grand rounds" as part of the medical training program at the Veterans Administration hospital in Reno and the University of Nevada Medical School.

OBJECTIVE 2: To enhance and improve teaching and learning for medical students in the conducting of "grand rounds" at the Veterans Administration hospital in Reno.

OBJECTIVE 3: To develop along the term of the pilot project a sense of continuing need for this service by the Medical School and the Veterans Administration hospital.

OBJECTIVE 4: To explore during the project, other possible continuing uses and applications for the video service between the Medical School and the Veterans Administration hospital.

**TELECOMMUNICATIONS
SPECIAL PROJECTS QUESTIONNAIRE**

PROJECT NAME UNSNET
FUNDING SOURCE UNSCS Budget AMOUNT \$120K
PROJECT COORDINATOR Dick Belaustegui
AGENCY University of Nevada System Computing Services (UNSCS)
BRIEF DESCRIPTION OF PROJECT:
(Who is served? How is it used? Information transmitted?)

GOAL: To provide data connectivity between all divisions of the University of Nevada System.

OBJECTIVE 1: To support all teaching, student, faculty, administration and research data communications connectivity between and among all the University of Nevada divisions.

OBJECTIVE 2: To provide equal access/equal service for all data communications needs by students, faculty, researchers, administration in the University of Nevada System.

TELECOMMUNICATIONS
SPECIAL PROJECTS QUESTIONNAIRE

PROJECT NAME UNS LANS
FUNDING SOURCE Campus Budgets **AMOUNT** varies with campus
PROJECT COORDINATOR Dick Belaustegui/many campus coordinators
AGENCY University of Nevada System Computing Services and all
UNS Divisions.
BRIEF DESCRIPTION OF PROJECT:
(Who is served? How is it used? Information transmitted?)

- GOAL:** To provide compatible, interconnectable LANS and LAN services for data, video and voice for all Divisions and campuses of the University of Nevada System.
- OBJECTIVE 1:** To provide cost effective internal connectivity for all data, video and voice use by students, faculty, researchers and administrations in the University of Nevada System.
- OBJECTIVE 2:** To provide compatible interfaces between campus LANS and system link for statewide connection of campus data, video, and voice services to be used by all students, researchers, faculty and administrators system-wide.
- OBJECTIVE 3:** To reduce costs of moves and rewiring of facilities for communications throughout the UNS System.
- OBJECTIVE 4:** To provide a uniform and universally available interface and connectivity point to attach any and all data, voice and video equipment into the campus and University-wide LAN networks.

**TELECOMMUNICATIONS
SPECIAL PROJECTS QUESTIONNAIRE**

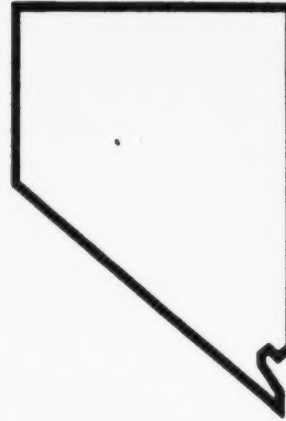
PROJECT NAME System Link
FUNDING SOURCE UNSCS Budget Request **AMOUNT** \$267,660
plus \$933. annual
PROJECT COORDINATOR Dick Belaustequi
AGENCY University of Nevada System Computing Services (UNSCS)

BRIEF DESCRIPTION OF PROJECT:
(Who is served? How is it used? Information transmitted?)

- GOAL:** To provide connectivity for voice and high speed data between and among all the University of Nevada Divisions.
- OBJECTIVE 1:** To provide more bandwidth at higher speed and lower cost for voice and data between Reno and Las Vegas for the University of Nevada's internal use.
- OBJECTIVE 2:** To provide more bandwidth at higher speed and lower cost for voice and data between all University divisions to a Reno hub center in the North and a Las Vegas hub center in the South for the University of Nevada's internal use.
- OBJECTIVE 3:** To provide for all students, faculty, researchers and administration low cost, high speed internal intra division data and voice connectivity with equal service and access for all users.
- OBJECTIVE 4:** To provide the necessary internal connectivity to support such other projects as Economic Development and diversification, super computer access, national and international mail access via BITNET and other networks, for all students, faculty, researchers and administration in the University of Nevada System.
- OBJECTIVE 5:** To provide interconnectivity for all campus LANS into the statewide system link and to all UNS system connections to national and international networks.

10.2 TELEPHONE INDUSTRY REPORT

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Section I
ACR 68 Report



ACR68 REPORT

This Document is a Telephone Industries Report that was requested by the ACR68 Study Committee.

Implementation of recommendations resulting from the study will result in the establishment of a leading edge communications network for Nevada governmental entities and educational institutions. The network will be a national showcase capable of meeting the diverse, yet unified telecommunications needs of Nevada's governments. Such a network is essential if Nevada wishes to keep pace with national technological and educational trends.

As defined in ACR68, needs exist throughout Nevada to provide:

- Additional instructional materials to enhance educational opportunities of pupils in public schools
- Continuing educational opportunities at the universities to professional persons living and working in rural Nevada
- Reduction in the deficiencies and inefficiencies of state and local government telecommunications.

Historically, Nevada State government, the University System, the Educational Community, and County and local governments have collaborated in only a limited manner while fulfilling their respective communications needs. For example, the State of Nevada GSA operates the Enhanced Simplified Telecommunications System (ESTS) utilizing Analog and Digital Centrex to provide statewide six-digit dialing. Independently, the University of Nevada-Reno, operates their Centrex System with Least Cost Routing.

Within State government, a variety of heterogeneous data networks, among them, the Department of Transportation Computer System, the Department of Motor Vehicles Computer Access Network, and the Employment Security Department Computer Network, have evolved.

The University of Nevada "Unite" Teleconferencing System provides limited teleconferencing capabilities from Reno to remote cities such as Fallon, Winnemucca, and Elko.

The University of Nevada System also utilizes satellite downlinks at college campuses to provide PBS broadcasts.

The majority of these networks use analog technology. For example, the University of Nevada-Reno Centrex, and "Unite" Teleconferencing systems are analog. So are most State computer system networks.

Additional shortcomings in Nevada's communications infrastructure include:

- Communications capacity constraints
- Rising communications costs
- Lack of statewide direction

The Nevada Telephone Industry has formulated a plan to overlay the requirements of State, local government and educational institutions onto our existing and future networks. The plan consists of three phases which, when implemented, will meet and exceed needs defined in ACR68.

For the purpose of this report, study criteria you identified considers deployment of video services to Nevada cities and towns that have high schools. Additionally, because the Nevada telephone industry has chosen to use an "overlay of services" approach to long term planning; city, county, and state centers of government and education were also considered to be potential users of enhanced digital services.

At the completion of Phase III, the Nevada telephone industry will provide a DIGITAL BACKBONE NETWORK that connects 16 concentration points, or HUB Cities, and distributes services to all 40 identified study locations. (Refer to Section VII for classification and description of cities).

The DIGITAL BACKBONE NETWORK will be available to the State of Nevada under contract. It will provide transport for digital services offered to the State.

Much of the network will be provided on fiber, however, some will be on digital radio or "T" cable. Regardless of the technology used, services will be provided at required rate and quality, i.e., DS3, DS1, or DS0.

Some of this network is in place today, and much of the rest is scheduled in the near future. (See Section VIII Telephone Company Industry Facilities Maps).

This network has the ability to provide increased bandwidth capacity as needs arise.

To meet the needs of ACR68 we will provide four basic services that overlay the DIGITAL BACKBONE NETWORK:

- Northern LATA Toll Calling Network
- Digital Facility Network
- Interactive Video Network
 - Primary Network
 - Secondary Network
- Network Management Plan

The NORTHERN LATA TOLL CALLING NETWORK, defined in Section II, uses existing facilities and switching equipment of the local telephone companies to provide voice calling for all ACR68 study groups. This approach ensures that compatibility of unlike systems will not be a problem since all entities will use the public switched network, which provides that compatibility today.

Because the toll plan includes various study groups, the combined call volumes provide ECONOMIES OF SCALE that allow Nevada Bell to offer the State of Nevada substantial savings. In cases where call volumes increase sufficiently to justify dedicated facilities, economies will continue to be derived by deploying the DIGITAL FACILITY NETWORK.

The DIGITAL FACILITY NETWORK will use the latest technology to intertie computers at virtually any speed rate. This network will also provide the highest quality voice and radio dedicated circuits.

In our study it was found that 98% of all services are hubbed and/or terminated in 16 cities. Grouping all user requirements at these hub points provides the economies of scale that permit bulk pricing of bandwidth. (Refer to Section III).

The third network area to be addressed is the INTERACTIVE VIDEO NETWORK. Technological improvements in video as a teleconferencing tool and educational medium have resulted in rapid advancement of digital transport for video. The digital bandwidth required to transport a video signal has been greatly

reduced by new methods of converting a digital signal to a video signal. By using this converting technology, the State can take advantage of the economies of the backbone network to provide full motion interactive video. The video service will be provided in two types, full motion and full motion compressed. These are described in Section IV.

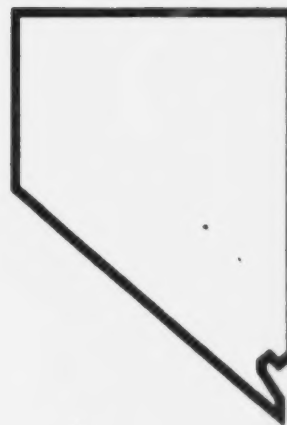
The networks described will be administered through a NETWORK MANAGEMENT PLAN. This plan will designate standard network interface requirements; administer billing functions; coordinate network design; and provide partitioning needs. (Refer to Section V for more information).

To summarize, the Nevada telephone industry is ready to answer the needs and requirements of ACR68.

This can be accomplished through implementation of this plan in three phases as described in Section VII. Possible implementation schedules are as follows:

- Phase I can be provided over the Nevada telephone industry network as it will exist in December 1988 and can be fully implemented within 12 months of a contract.
- Phase II can be implemented within 24 months of a contract.
- Phase III replacement of analog facilities with digital facilities is now scheduled for 1997, but earlier deployment can be opened to negotiation.

Section II Northern LATA Toll Calling Network



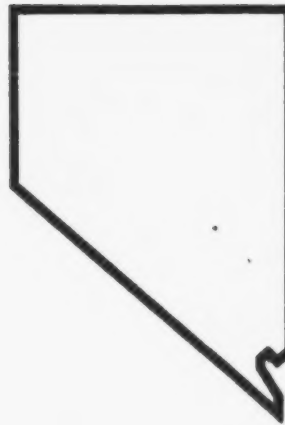
NORTHERN LATA TOLL CALLING NETWORK

NEVADA BELL proposes to offer the State of Nevada, under special contract, a pricing discount on intraLATA long distance calls within the Northern Nevada LATA.

Currently, large toll users such as the State, the University of Nevada-Reno, and larger cities and counties are using various services, e.g., least cost routing, WATS, or the State microwave, to achieve savings on intraLATA toll calling. In each case, economies are derived only if the use is large enough to meet certain bulk pricing criteria. The focus of ACR68 is to consolidate services to achieve economies of scale for pricing and levels of service.

The NORTHERN LATA TOLL CALLING NETWORK will provide a bulk discount rate to the State of Nevada and other tax-based entities by considering all entities as one, very large user group for purposes of pricing.

Section III Digital Facilities Network



DIGITAL FACILITIES NETWORK

The DIGITAL FACILITIES NETWORK will utilize the capacities of the Digital Backbone Network. In our study of the State's present network, we identified 16 cities, of the 40 study cities, where concentrations of private lines occur. These 16 cities are natural hubbing points to consolidate individual private line circuits into digital, 24-circuit groups or a DS1 channel. This type of consolidation to DS1 level will allow the State of Nevada to achieve pricing economies of scale.

DS1 channel service allows the concentration of basic services such as voice, data, and facsimile into a single DS1 channel. DS1 service can be provided beyond the 16 hubbing cities if the need arises, and if a digital facility is present. (See Nevada Telephone Industry Facilities Maps, Section VIII).

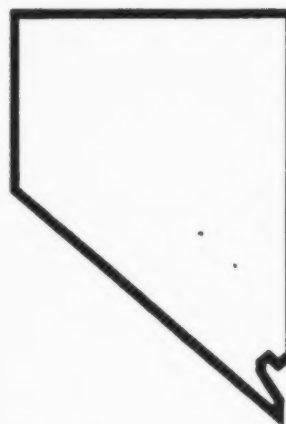
The 16 hub cities are:

Austin	Gabbs
Battle Mountain	Hawthorne
Beatty	Indian Springs
Carson City	Las Vegas/N. Las Vegas.
Elko	Lovelock
Ely	Reno/Sparks
Eureka	Tonopah
Fernley	Winnemucca

Section IV

Interactive Video Network

(Primary)
(Secondary)



INTERACTIVE VIDEO NETWORK (PRIMARY) - PHASE I

The Phase I telephone company leased INTERACTIVE VIDEO NETWORK (PRIMARY) will provide broadcast quality video service. It can be one-way video, two-way audio, or two-way interactive video with two-way audio.

The suggested start-up INTERACTIVE VIDEO NETWORK (PRIMARY) is a DS3 Digital Circuit. It will have terminations in Reno, Carson City, Fernley, Lovelock, Winnemucca, and Hawthorne, which are designated as "A" cities. There will be a network control point in Fernley which will allow the State to control the video signal at the Fernley hub. This network will terminate in telephone company central offices in the previously mentioned cities and will provide conversion of signals from digital to video. If more than one video location in a city is required, the backbone will also include a video switch in the central office.

Following are possible applications:

- The Secondary Education System will be able to provide cost effective video classes from one city on the network to any other city on the network.
- Higher education will be able to provide accredited video courses to interested parties in remote rural cities to fulfill requirements for masters or other degrees.

- Teleconferencing will be available to a number of tax-based public agencies. Their utilization of this service could greatly reduce travel costs. Some of the agencies that may benefit from this service are:

- State Administration
- Legislative Hearings
- PSCN Hearings
- Gaming Control Board
- Human Resources
- Nevada Military
- Library
- Transportation Department

Last Mile (Primary Network)

The last mile of facilities from any telephone company central office on the video backbone network will be provided by fiber connection. The codec used to convert signals from digital to video will be located in the central office. This will reduce capital requirements for Customer Premise Equipment (CPE) to provide full motion broadcast quality video. The only CPE equipment required will be video cameras, television sets, and audio equipment.

INTERACTIVE VIDEO NETWORK (SECONDARY) - PHASE I

The Phase I SECONDARY network will allow extension of the video backbone to additional cities designated as "B" cities. The compressed full motion video supports classroom and meeting applications, including two-way interactive video and audio. This type of service, provided on DS1, is now available to a large number of the study cities using the present telephone company network.

This service will be provided by connecting a primary backbone point (i.e., Winnemucca) and a secondary network point (i.e., McDermitt) with a DS1 digital circuit. The codec needed to convert the digital signal to a video signal must be furnished by the end customer. A video signal can be sent from any city on the backbone or secondary network to any other city on the backbone or secondary network. The sending location will need to be equipped to transmit a video signal.

The use of existing telephone company networks will reduce the need to construct facilities and, therefore, avoid high start-up costs. Other positive considerations are:

- Service can be provided much sooner since the network is in place today.
- Secondary education will be able to provide cost effective video classes to remote high schools in the state.
- Teleconferencing can be provided to a number of tax-based public agencies. This could greatly reduce travel costs.

Last Mile (Secondary Network)

The last mile of facilities on the secondary network will be from the central office to the customer premise. This last mile will be provided at a DS1 grade of service over copper wire.

Because service will be provided on telephone company facilities, special construction costs can be avoided. Service can be leased under a contract arrangement.

Customer Premise Equipment (CPE) required for compressed video applications has been dramatically improved in recent years. Package units are now available that do not require special room construction. These units include cameras, television sets, audio equipment, data equipment and codecs. They are designed for meeting and classroom applications.

VIDEO BACKBONE - PHASE II

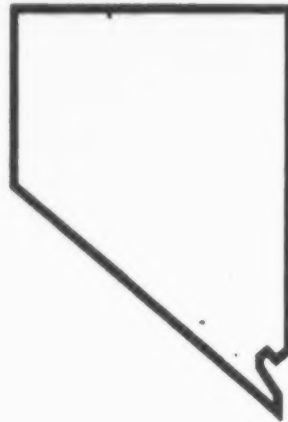
Phase II includes all areas covered in Phase I. In addition, broadcast quality full motion video capability is provided to Tonopah, Beatty, Indian Springs and Pahrump making them "A" cities.

The secondary network will continue to be provided as in Phase I.

VIDEO BACKBONE - PHASE III

Phase III will add the East Central part of the state to the video backbone network. It will be accomplished by building a new fiber route from Hawthorne through Gabbs, Austin, and Eureka to Ely. Present plans call for this route to be replaced in 1997. At that time, the previously mentioned locations become "A" cities with broadcast quality full motion video.

Section V Network Management Plan



NETWORK MANAGEMENT PLAN

The NETWORK MANAGEMENT PLAN will address two network control systems; video and digital. Both systems will be controlled by the State from one Administration Panel.

The proposed Video Control System will utilize a digital hub switch located in Fernley. State personnel will operate the system using an Administration Panel. There will also be video switches at locations that require more than one video channel per city. These switches can be controlled by the Administration Panel also. Video connections can be preprogrammed in advance, or changed at will. There will be a log for billing and records purposes.

The proposed Digital Access and Cross-connect System (DACS) will provide the ability to rearrange your network to accommodate fluctuating voice and data requirements.

Reconfiguration can be accomplished by either of two methods:

1. Preprogrammed entry
2. Real time on-line entry

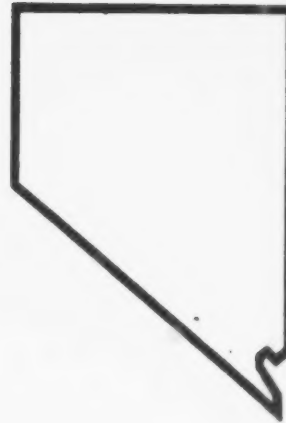
You will also have the ability to establish emergency contingency plan configurations. By using this capability, the cost of parallel facilities can be saved.

To provide individual budgeting, a billing system for each type of service will be established. The system will have the flexibility to bill by time, by unit, or by a combination of time and units.

This billing system will administer the video and the digital networks.

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Section VI Costs



COSTS

The ACR68 network has been developed as a combined service package. Communications requirements have been consolidated to realize pricing economies of scale. The proposed rates were developed with the understanding that ALL THREE NETWORKS will remain in service for ten years. ALL rates are subject to PSCN approval. For your convenience, the services and their costs have been individually itemized. The rates shown are order of magnitude ± 10%.

NORTHERN LATA TOLL CALLING NETWORK

A MINIMUM call volume requirement based on monthly "minutes of use" will be established. It will cover all user groups. The proposed long distance rate is \$.22 per minute. This rate will apply to ALL long distance calls made by the ACR68 study group as long as minimum monthly call volume requirements are met or exceeded.

DIGITAL FACILITY NETWORK

The proposed rate for digital facilities will be based on a DS1 channel. A DS1 channel has capacity for 24-circuits. The rate for a DS1 channel will be \$16.00 per mile. The mileage will be measured by facility route.

A multiplex/demultiplex charge of \$12.00 per month, per circuit will apply when a circuit is added to, or deleted from the backbone network.

INTERACTIVE VIDEO NETWORK (PRIMARY)

The video network will provide broadcast quality full motion interactive video over the backbone network. All cities on the backbone network will have access to this service. These cities have been described as "A" cities. The proposed rates for this service are:

Network Mileage Rate	\$104.00 per mile, per month
Network Control Hub Per Port Rate	\$110.00 per month
Digital to Video Conversion, Per City	\$520.00 per month

If more than one location in an "A" city requires access to the video signal, a video switch will be provided.

Per Port Rate	\$110.00 per month
---------------	--------------------

INTERACTIVE VIDEO NETWORK (SECONDARY)

This network will provide interactive full motion compressed video from an "A" city to a "B" city. The proposed rates will be:

Including equipment to convert	\$2,400 per month
from the primary video network	
to the secondary video network	
at the "A" city location.	

This rate is for a DS1 channel	\$382.26 per month
between the "A" city location and	
the customer premise in the "B" city.	

Mileage rate applies per DS1 channel	\$16.00 per mile, per month
between "A" and "B" cities.	

LAST MILE COST VIDEO NETWORK (PRIMARY)

The Last Mile Cost presented here represents the rates that will apply to provide a video connection between a high school and the telephone company central office. All of these are "A" cities and the video service will be provided on fiber.

<u>High School</u>	<u>Monthly Rate</u>
Carson City	\$ 650
Eureka	1,040
Lowry	2,550
Fernley	1,420
Austin	1,120
Battle Mountain	820
Hawthorne	680
Beatty	970
Gabbs	680
Pahrump	1,640
Lovelock	820
Hug	1,700
Wooster	1,460
Sparks	435
Reno	790
Reed	1,240
McQueen	1,300
White Pine	860

LAST MILE COST VIDEO NETWORK (SECONDARY)

The last mile costs for the secondary video network are included in the rate described under Video Network (Secondary). The reason for this is that the rate of the secondary video network includes a DS1 channel to the customer premise (high school).

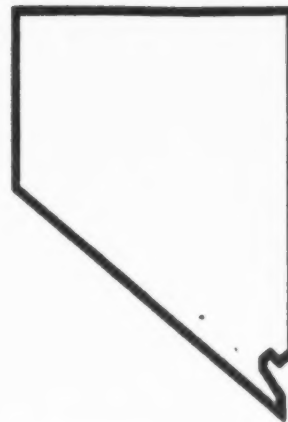
NETWORK CONTROL

The rate in this report addresses only video network control. The proposed rate is \$1,300 per month for the entire system.

The price for the Digital Access and Cross-connect System (DACS) cannot be determined without a specific network design. We look forward to working with you to develop this design.

Section VII

Cities By Service Category



CITIES BY SERVICE CATEGORY

For the purpose of this report we have chosen to divide cities and towns into three types, and identify them with a letter. These types and designations follow:

"A" cities will be cities or towns that will have access to full motion, BROADCAST QUALITY interactive video. This type of video will be provided to the customer premise in a format that will allow the end user to MINIMIZE capital investment. The only customer premise equipment required will be television sets, cameras, control equipment, and audio equipment. "A" cities will also have Digital Facilities Network services available. This will allow the State to buy DSL rate services where there is sufficient need for bandwidth.

"A" Cities - See associated Phase Maps

Phase I

Carson City
Reno
Fernley
Lovelock
Winnemucca
Las Vegas
Boulder City
Henderson

Phase II

Carson City
Reno
Fernley
Lovelock
Winnemucca
Las Vegas
Boulder City
Battle Mountain
Elko
Tonopah
Beatty
Indian Springs
Pahrump
Henderson

Phase III

Carson City
Reno
Fernley
Lovelock
Winnemucca
Las Vegas
Boulder City
Battle Mountain
Elko
Tonopah
Beatty
Indian Springs
Pahrump
Gabbs
Austin
Eureka
Ely
Henderson

"B" cities will be cities and towns that will have access to full motion interactive COMPRESSED video. This service will be provided over DS1 digital facilities. The last mile from the central office to the customer premise will be provided at the DS1 level. The codec needed to convert a digital signal to a video signal must be furnished by the end customer. "B" cities will also have available digital bulk rate service. This will allow the state to buy DS1 rate services where there is sufficient need for bandwidth.

"B" Cities - See associated Phase Maps

Phase I

Incline
Virginia City
Zephyr Cove
Minden
Dayton
Yerington
Fallon
Gerlach
McDermitt
Battle Mountain
Elko
Beatty
Indian Springs
Pahrump

Phase II

Incline
Virginia City
Zephyr Cove
Minden
Dayton
Yerington
Fallon
Gerlach
McDermitt

Phase III

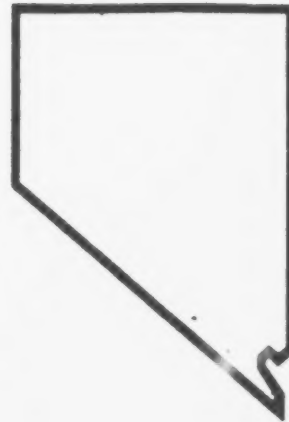
Incline
Virginia City
Zephyr Cove
Minden
Dayton
Yerington
Fallon
Gerlach
McDermitt
Lund

"C" cities will be cities and towns that will have no digital service. The network serving them will be analog and therefore only analog service will be available. Video cannot be carried on the present analog network.

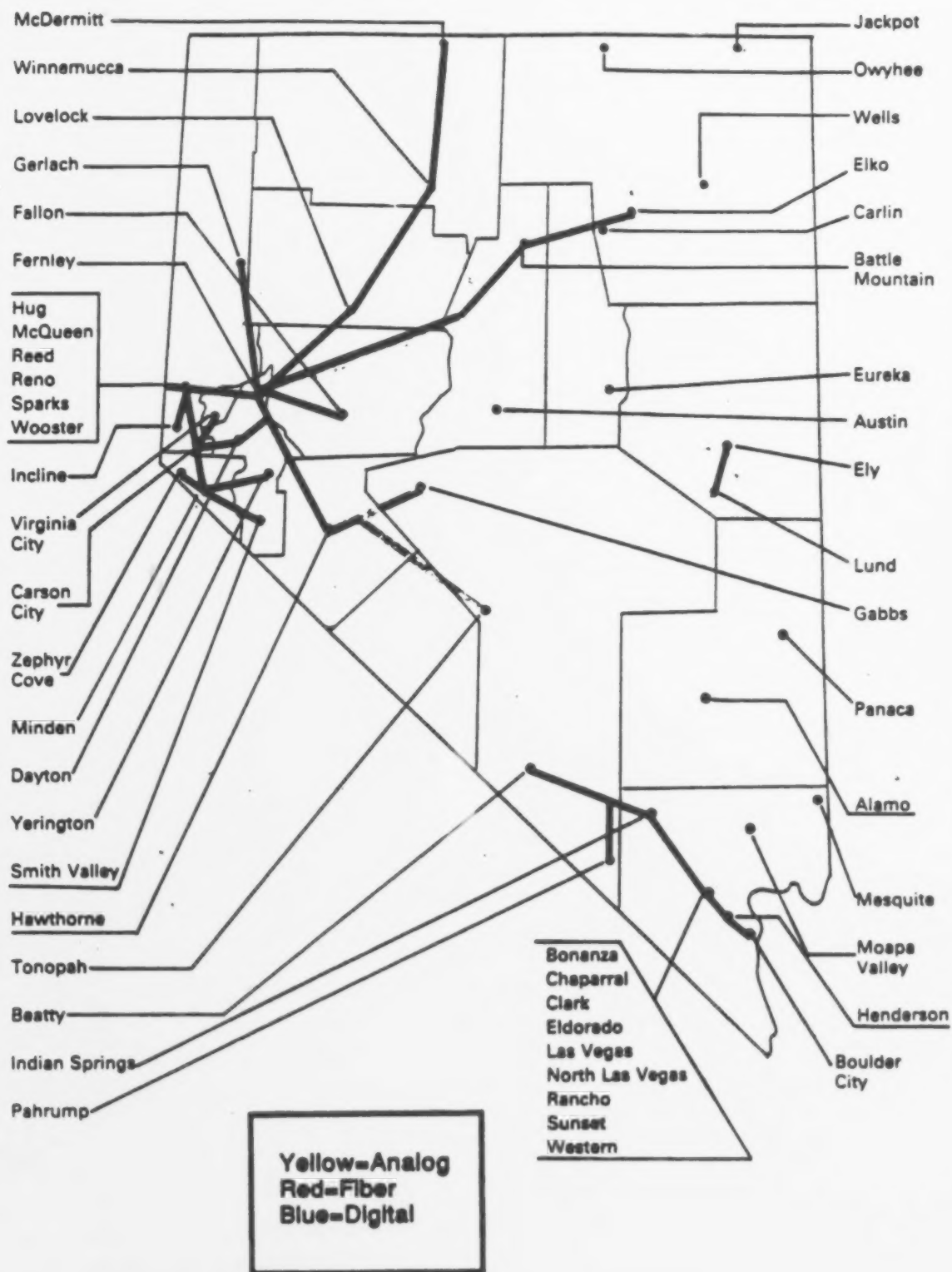
"C" Cities - See associated Phase Maps

<u>Phase I</u>	<u>Phase II</u>	<u>Phase III</u>
Gabbs	Gabbs	Carlin
Tonopah	Carlin	Wells
Carlin	Wells	Panaca
Wells	Austin	Alamo
Austin	Eureka	Moapa Valley
Eureka	Ely	
Ely	Panaca	
Panaca	Alamo	
Alamo	Moapa Valley	
Moapa Valley	Lund	
Lund		

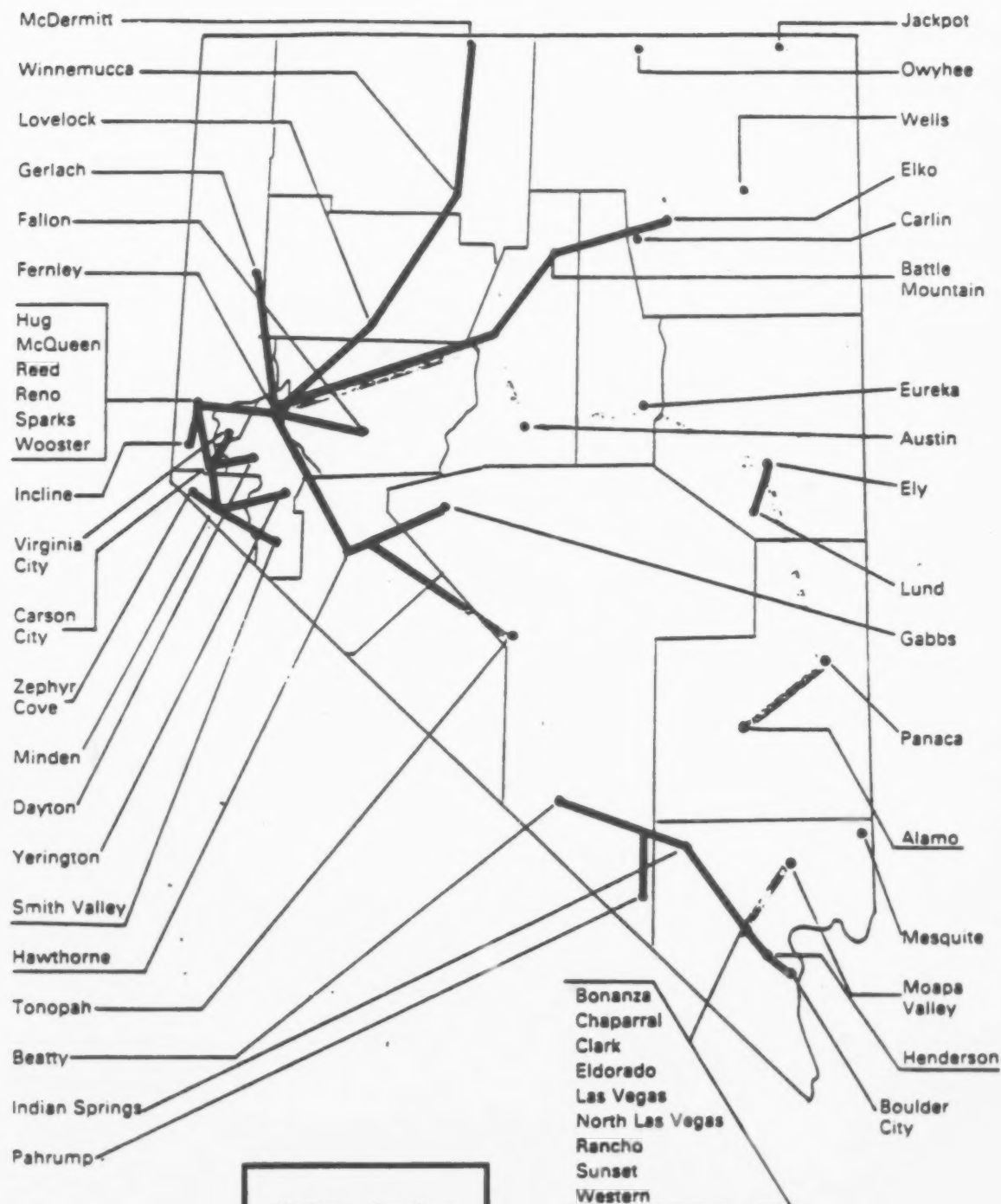
Section VIII Network Maps



Present Nevada Telephone Industry Network

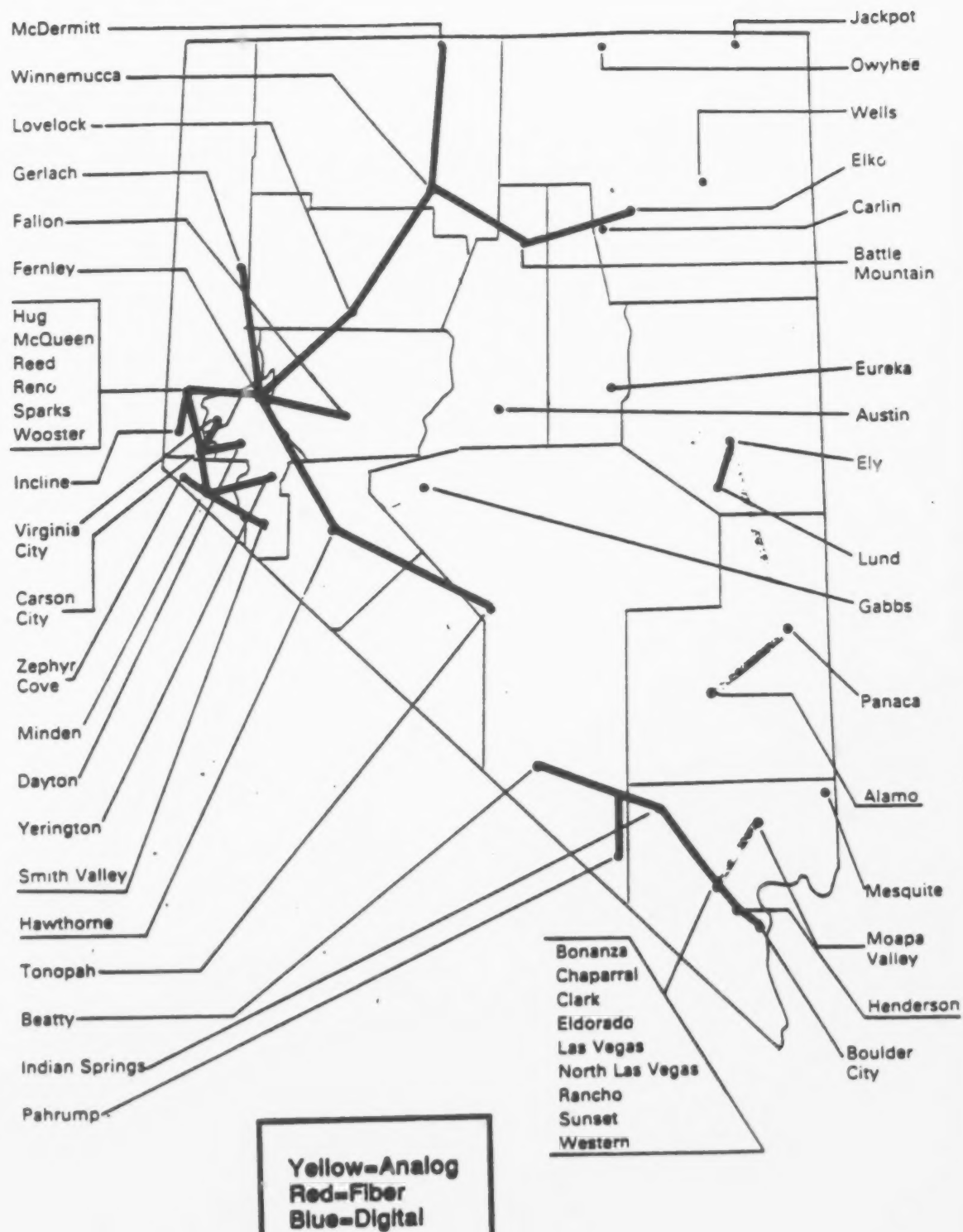


Phase I

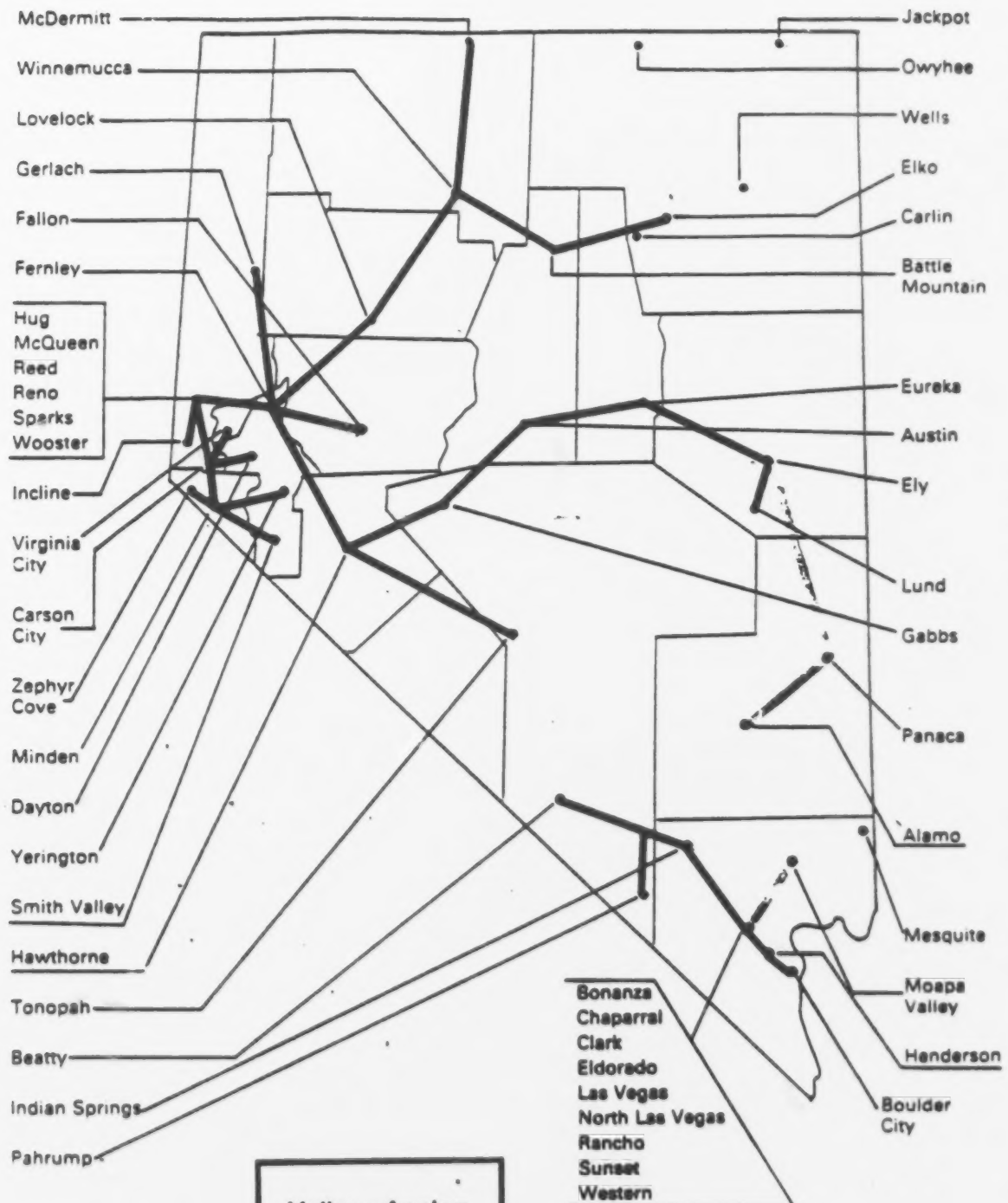


Yellow=Analog
Red=Fiber
Blue=Digital

Phase II



Phase III



10.3 ACTIVITY IN OTHER STATES

States are large complex organizations with broad responsibilities. Their business ranges from public education and economic development to licensing motor vehicles and maintaining libraries. States conduct their diverse operations over wide areas and, not surprisingly, state government is the largest user of telecommunications in most states.

Rapid advances in technology and changes in regulatory policy have had a significant impact on the type of telecommunications services available and in the manner in which these services are delivered. As a result, many states have recently reevaluated their telecommunication infra-structure which is so vital to the conduct of state business. The following capsule summaries give an overview of telecommunication activity in other states.

CALIFORNIA - The state of California will soon award a contract to replace the state's separate voice and data networks with a single integrated voice and data backbone transmission and network management system. Presently the network services 85% of the city and county governments who pay the state telecommunications division a fee for services provided. The new network is expected to reach near 100% of city and county government with expanded services.

INDIANA - Indiana Telecommunications Network (Intelnet) is a fiber optic backbone network leased from GTE Telcom that serves 16 sites where customers will access services. Intelnet provides voice, data and video services to state government, universities, school districts, libraries and city and county government. The network is expected to save Indiana taxpayers \$34 million over the next 10 years.

WYOMING - Mountain Bell and the state of Wyoming have agreed to a pact under which Mountain Bell will build a fiber optic link between Casper and Cheyenne. Rates for voice, data and video services are under negotiation. The fiber optic link is a major step toward making Wyoming competitive with other states for services and information businesses.

OHIO - After a three year study of Ohio's communications needs, the Ohio legislature authorized construction of a backbone network to provide communications for all state agencies and the Ohio University System. The network is expected to save \$5 million per year over the 15 year life of the system.

COLORADO - In the summer of 1988, the University of Colorado will complete a fiber optic link among its four campuses. The transmission system will enable the university to transmit voice, data and commercial-quality video from any campus to any or all campuses. As operational experience is gained, capacity may be made available to other state agencies.

MINNESOTA - The Wasioja Education Technology Cooperative in Dodge County has linked 10 schools with fiber optic cable to allow the schools to share costs and resources in providing interactive televised instruction.

NORTH CAROLINA - The North Carolina Agency for Public Telecommunications (NCAPT) was created to develop innovative applications of telecommunications for state agencies and the legislature. NCAPT recently received a \$100,000 award for excellence from the Ford Foundation for NCAPT's panel discussion on state policy issues that is broadcast to more than 100 cities from NCAPT studios.

GEORGIA - Georgia's new statewide network leases switching capacity from Southern Bell Telephone, transmission capacity from US Sprint and network management from GTE. The network serves more than 460 user agencies and is expected to save over \$1 million a year.

ALASKA - Telecommunications has been used for over a decade to deliver public services such as: 1) linking health aides at 120 remote sites to doctors in regional hospitals; 2) networking over 200 locations to provide a full high school education and 3) providing audio teleconferencing to 55 sites so that Alaskans can participate in legislative hearings.

LOUISIANA - Louisiana raises about \$6 million a year by selling data files of fire and motor vehicle information to insurance companies via dedicated telecommunication links.

WISCONSIN - The State of Wisconsin has awarded AT&T a nine year, \$44 million contract, for a network that will replace four separate, overlapping systems and unify voice and data network management at a dedicated operations center.

ASSEMBLY CONCURRENT RESOLUTION 68

Assembly Concurrent Resolution No. 68--Committee on Education
FILE NUMBER 143

ASSEMBLY CONCURRENT RESOLUTION--Directing the director of the Department of General Services to conduct an interim study relating to telecommunications in Nevada.

WHEREAS, A need exists throughout Nevada to provide, by means of the latest developments in telecommunications, additional instructional materials to enhance the educational opportunities of pupils in the public schools and to provide continuing education at the universities to professional persons within the state; and

WHEREAS, The system of telecommunications owned by the state and used by the state and local governmental entities is riddled with deficiencies and inefficiencies; and

WHEREAS, The states of Illinois, Indiana, New York and Wisconsin find that communications by fiber optics provide an efficient means for delivering educational materials and satisfying state and local needs for telecommunications; and

WHEREAS, A network of fiber optics provides the means of delivering publicly broadcasted programs throughout the state in accordance with the objectives of Senate Concurrent Resolution No. 24, of the 62nd session of the Nevada Legislature; and

WHEREAS, A comprehensive study of the potential for the development of a network of fiber optics in the state would assist in serving the state's educational and administrative needs for telecommunications; now, therefore, be it

RESOLVED BY THE ASSEMBLY OF THE STATE OF NEVADA, THE SENATE CONCURRING, That the director of the Department of General Services conduct a study of the needs of the state relating to telecommunications; and be it further

RESOLVED, That the director of the Department of General Services work in cooperation with state agencies and local governmental subdivisions, public school districts, the University of Nevada System, public utilities and private organizations within the state in conducting this study; and be it further

RESOLVED, That the Speaker of the Assembly shall appoint one member of the Assembly and the Majority Floor Leader of the Senate shall appoint one member of the Senate to serve as members of a technical advisory committee to provide advice to the director of the Department of General Services regarding the study; and be it further

RESOLVED, That the members of the advisory committee are entitled to receive the salary provided for a majority of the members of the Legislature

during the first 60 days of the preceding session for each day they are actually engaged in the business of the committee; and be it further

RESOLVED. That the director of the Department of General Services, with the approval of the Interim Finance Committee, may receive money, grants, gifts and services related to this system of telecommunications; and be it further

RESOLVED. That the director of the Department of General Services shall report the results of the study and any recommended legislation to the 65th session of the Legislature and to the Governor; and be it further

RESOLVED. That the Chief Clerk of the Assembly transmit a copy of this resolution to the director of the Department of General Services.